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Suwon Voluntary Report on SDGs Goal 11

For HLPF 2018

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AUTHORS

Lee Jae-eun, President of Suwon Research Institute (SRI)

Park Yeonhee, Director of ICLEI Korea Office & Global Future Research Institute of SRI

- | | |
|---|--|
| 11.1. Kim Do-young, Research Fellow at SRI | 11.5. Kim Eunyoung, Research Fellow at SRI |
| 11.2. Kim Sukhee, Research Fellow at SRI | 11.6. Kang Eunha, Research Fellow at SRI |
| 11.3. Choi Seokhwan, Research Fellow at SRI | 11.7. Chung Soojin, Research Fellow at SRI |
| 11.4. Ryu Hyunhee, Research Fellow at SRI | |

CONTRIBUTORS

Shim Hyunmin, General Manager of ICLEI Korea Office

Kang Jeongmuk, Manager of Policy & Knowledge Management Team, ICLEI Korea Office

Kim Chansoo, Chairman of Steering Committee, Suwon Council for Sustainable Development

Park Jongah, Secretary-General, Suwon Council for Sustainable Development

Suwon City Government (Environmental Policy Division and related departments)

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Contents

Preface	3
1 Introduction	5
2 Suwon’s Review on 7 Targets of SDG 11	7
2.1 Review of Target 11.1	8
2.1.1 How it works in Suwon	9
2.1.2 What to do	10
2.2 Review of Target 11.2	11
2.2.1 How it works in Suwon	11
2.2.2 What to do	13
2.3 Review of Target 11.3	15
2.3.1 How it works in Suwon	15
2.3.2 What to do	18
2.4 Review of Target 11.4	19
2.4.1 How it works in Suwon	19
2.4.2 What to do	22
2.5 Review of Target 11.5	23
2.5.1 How it works in Suwon	23
2.5.2 What to do	25
2.6 Review of Target 11.6	26
2.6.1 How it works in Suwon	27
2.6.2 What to do	29
2.7 Review of Target 11.7	30
2.7.1 How it works in Suwon	30
2.7.2 What to do	32
3 Conclusion	33

Preface

With rapid urbanization, the concern over the sustainability of the global environment sparked the international debate on environment and development. And the results of the discussion were epitomized by 'Agenda 21' at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992. Since then, the UN-led efforts to create a sustainable global environment had resulted in the Millennium Development Goals (MDGs) in 2001 and led to the adoption of the Sustainable Development Goals (SDGs) in 2015. As part of the global efforts to achieve SDGs, the United Nations High-level Political Forum on Sustainable Development (HLPF) annually held to check the implementation status of SDGs with a sense of responsibility. The focus of the HLPF 2018, which will be held in July 2018, will be monitoring the implementation status of "SDG 11."

SDG 11, which aims to "make cities and human settlements inclusive, safe, resilient," has 7 Targets covering areas of residence, public transportation, urban planning, cultural heritage, resilience, environment and waste management, and open space and three Sub-targets working as the fundamental tools for the implementation: linking urban, peri-urban and rural areas; integrated policy; and government capacity. The tasks of SDG 11 are in line with the functions that the Network of Local Governments (NLG) has pursued the recognition that the success of sustainable development is up to cities and their local governments.

SDG 11, as a critical plan for the world's sustainable development, has been discussed at various conferences like the United Nations Conference on Human Settlements (HABITAT) and by many organizations, including ICLEI-Local Government for Sustainability. Notably, the "New Urban Agenda (NUA)," which was adopted at HABITAT III held in Quito in 2016, well epitomizes the essence of the agenda. The close partnership between diverse stakeholders and their participation would be the key to achieving SDGs. Notably, the cooperation between the United Nations, member states, local governments, and other stakeholders would be of the utmost importance.

Recognizing the importance of the environment, Suwon City has put its priority on people-centered policy for sustainable urban development since 2010 and has been dedicated to establishing urban infrastructure for the safety of citizens. The city enacted the Ordinance for Sustainable Development and launched the Suwon Council for Sustainable Development, an organization with a private-public governance structure, and adopted its own 10 Sustainable Development Goals through a private-public partnership, which is localized and optimized version of UN SDGs. In addition, the Suwon Research Institute (SRI) was established as a think-tank to study the specific tasks and strategies of Suwon for the implementation of Sustainable Development Goals while the newly established Suwon Sustainable City Foundation is mandated with implementing the tasks and projects related to urban sustainability. With the hosing of the ICLEI Korea Office in Suwon in 2012, Suwon is also taking the leadership on urban sustainability in South Korea by making efforts to spread the international community's efforts and experiences on achieving sustainable development.

Suwon City and the Suwon Research Institute, in cooperation with various entities and organizations, examined the tasks and implementation status of the seven targets of SDG 11, in line with the HLPF to be held in July 2018. This paper is Suwon Implementation Report on Goal 11 and has been prepared after through the participation of various entities and organizations in Suwon, making it more unique and differentiated from those reported solely developed by the single institute or local government.

This report is expected to give an opportunity for Suwon to do a self-evaluation on the efforts the city has made for sustainable development, to provide the unique study on SDG 11 in local perspective

directly to global society which is hardly covered by Voluntary National Reports (VNRs) submitted by national governments, and to effectively achieve Suwon's own goals and multidimensional measures for the global sustainable development.

We hope that the efforts of Suwon, coupled with international cooperation and communication for the implementation of SDGs, would be able to sow the seeds for global sustainable development and spread them to more local and municipal governments across the world.

June 2018

Suwon City Government

Suwon Research Institute

Suwon Council for Sustainable Development

ICLEI – Local Government for Sustainability Korea (Office)

1 Introduction

Within two centuries of economic development fueled by rapid industrialization and urbanization, the entire world was faced with the crisis of sustainability. Since the warning of the Club of Rome in the 1970s, the international debate on environment and development has been diversified. As a result, the UN Member States reached agreement on the importance of sustainable development at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 and made the 'Rio Declaration on Environment and Development, and then the declaration led to the launch of the United Nations Commission on Sustainable Development (CSD) by the UN General Assembly as well as the organization of the Millennium Forum in 1998 in which more than 100 nations participated and discussed a wide range of topics such as poverty eradication, environment, and human rights protection. Later, all of such efforts had resulted in the adoption of the United Nations Millennium Declaration at the Millennium Summit in September 2000. However, the Millennium Declaration did not include the Millennium Development Goals (MDGs), which were discussed at the summit. In 2001, the Millennium Development Goals (MDGs) with the target year of 2015 were announced, based on the International Development Goals (IDGs) by the OECD and the IMF and the Millennium Declaration.

Since then, agendas have been pursued to realize the MDGs, mainly led by the UN, but they were met by mixed responses; some evaluated highly of their considerable achievements while others viewed the agendas as a short-sighted approach focused on unbalanced topics and regions. Based on the MDGs, the UN Summit on Sustainable Development, held in September 2015, adopted "Transforming our World: The 2030 Agenda for Sustainable Development" as a new agenda to be universally applied to the UN Member States over the next 15 years. A vital part of this agenda was Sustainable Development Goals (SDGs), broad goals that will lead to international action and investment for sustainable development for the next 15 years by 2030. Even though those who confirmed SDGs in New York were the government of each state, cities, local governments, and local communities are more closely related to the 17 Goals and 169 Targets of SDGs.

The global phenomenon of urbanization will continue during the implementation of SDGs. Today, cities are home to more than half of the world's population, and the number of urban dwellers is expected to increase by 60 million a year, and cities are estimated to account for 70% of the global economy. Such tendency clearly shows that cities play a pivotal role in politics, economy, and society in the 21st century. Emphasizing such importance of cities, the goal related to cities was included in SDGs. Among 17 Sustainable Development Goals, 'Sustainable Development Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable' (abbreviated as SDG 11 or Goal 11) well epitomize the issues facing cities.

The third United Nations Conference on Housing and Sustainable Urban Development (hereinafter referred to HABITAT III) was held in Quito in 2016, the following year of the introduction of SDGs. Habitat III has achieved the adoption of the "New Urban Agenda (NUA)", which would facilitate and provide guidelines for the actual implementation of SDG 11. Every year the United Nations sets areas to be monitored and check the progress of member states to encourage them to act on SDGs, and SDG 11 is the focus of monitoring this year.

With the aim of "Making cities and human settlements inclusive, safe, resilient and sustainable", SDG11 is composed of seven specific targets and three sub-targets, and the details about each target are shown in <Table-1>.

Table 1. Description of Goal 11 and its targets

Goal 11	Make Cities and human settlements inclusive, safe, resilient and sustainable
11.1	By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
11.2	By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
11.3	By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries
11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage
11.5	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to the global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
11.7	By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities
11.a	Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning
11.b	By 2030, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels
11.c	Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials

2 Suwon's Review on 7 Targets of SDG 11

With the aim of "People-centered, Bigger Suwon", the city government has pursued a safe and secure city for all which is also in line with "Cities for All" of Habitat III. In this regard, Suwon's self-examination on how Suwon's policy goals, measures, and the progress are evaluated in light of SDGs, or more specifically, Targets of Goal 11, will be of great significance for Suwon to pursue its policy goals and plans for sustainable development.

Therefore, in this paper, Suwon, along with many experts and organizations, tries to interpret the 7 Targets and Indicators of SDG 11 (excepting 11.a, 11.b, and 11.c which set out the basis or systems for the implementation of SDG 11) in the local context of Suwon, a city with 1.26 million population. In the meantime, the city will check its status in the implementation of SDGs and obstacles, and explore future tasks to improve the quality of life for citizens and realize the goal of making a sustainable city. I would like to share

Suwon has advanced itself to the levels of a considerably big city in many areas. In some aspects, Suwon may have already surpassed the universal standards set forth by the SDGs. In terms of quantitative indicators, the supply rate of housing and water and sewerage penetration rate are close to 100% in the city. Suwon has implemented various policies to make more progress in the city's indicators. The city hosted the EcoMobility World Festival for the first time in the world, carried out a variety of cultural projects and strengthened basic cultural infrastructure by building more cultural facilities such as libraries which help citizens learn and cultivate themselves. Suwon also has been dedicated to the creation of a comprehensive social safety net to ensure the well-being of all citizens. In addition, the city's commitment to preservation and protection of cultural heritage was well demonstrated by its restoration efforts for the Suwon *Hwaseong* Fortress. The city government has devoted itself to creating pleasant urban spaces such as parks. In the meantime, the city explored various types of governance systems such as 'Team of Citizen Planners' to engage more citizens in the process of pursuing such urban plans.

In addition, Suwon City enacted the Ordinance for Sustainable Development to achieve SDGs, which led to the launch of the Suwon Council for Sustainable Development, an organization with the private-public governance structure and the city adopted 10 Sustainable Development Goals of Suwon through a public-private partnership. The Suwon Research Institute was also established with the aim of conducting research on specific tasks and strategies for the implementation of SDGs. In addition, the city hosted the ICLEI Korea Office and has been holding the annual International Human City Forum to share exemplary cases of countries and Suwon's experiences in pursuing people-centered policies. In that way, Suwon is striving to contribute to the spread of SDGs across the world.

In spite of such efforts, Suwon, as a city with high population density, has its own share of urban problems and still has a long way to go towards an inclusive, sustainable and safe city. The potential tasks of Suwon which will be identified while preparing for this report will be a good basis for the city to set up and realize higher levels of its own goals for achieving SDGs by the target year of 2030.

2.1 Review of Target 11.1

Target 11.1	By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums
Indicator 11.1.1	The proportion of urban population living in slums, informal settlements or inadequate housing

Target 11.1 aims to address problems caused by inadequate housing by providing durable housing with drinking water, sanitation and adequate space (Architecture & Urban Research Institute, 2016). According to UN-HABITAT, a number of conditions must meet to be considered as "adequate housing": 1) access to basic water and 2) basic sanitation, 3) guarantee for land ownership, 4) durable housing and 5) enough space, and housing that doesn't meet the conditions is considered as "inadequate housing."

The targets of the Sustainable Development Goals of Suwon (Suwon SDGs) include 1) the guarantee of citizens' housing rights and expansion of public rental housing, and 2) reducing housing expenses of citizens and promoting social housing, and Suwon City checks the progress made in achieving the targets. The minimum housing standards of the Quality of Life Indices of Korea and Suwon SDGs' housing-related indicators are quantitative indicators of residential spaces and housing prices. So they can be considered as a means of evaluating "enough space" but not appropriate to evaluate the level of "access to basic water or sanitation". Therefore, Suwon City examined the status of residential spaces in Suwon by selecting indicators that seem most relevant to the conditions for adequate/inadequate housing defined by UN-Habitat, and the details are shown in the table below.

Table 2. Suwon Indicator on inadequate settlement

Target	Indicators
Guarantee of citizens' housing rights and expansion of public rental housing	The rate of public rental housing compared to total number of housing in Suwon
	The annual rate of public rental housing compared to the annual supply of total housing in Suwon
	Status of 1- and 2-person households and small-sized housing distribution rate in Suwon
Reducing housing expenses of citizens and promoting social housing	The ratio of rent to income
	The number of tenant households to the total number of households
	The budget for housing welfare (Budget for youth rental housing, youth dormitory, and rental housing for the low-income class)

Source: Suwon Council for Sustainable Development(2017), Suwon SDGs(3 areas, 10 goals, and 57 targets)

Located in the Seoul metropolitan area, Suwon has relatively good residential environments. So, Suwon City further strengthened conditions for adequate housing than those suggested by UN-Habitat.

[Access to basic water] As water supply facilities are connected to all households in Suwon, every citizen of the city has access to basic water. However, some households share bathrooms with others and lack hot-running water, and some houses are not equipped with kitchens or use shared types of kitchens.

[Access to basic sanitation] Even though most households in Suwon have flush toilets, we measured the percentage of households using conventional toilets and the percent of households sharing toilets with other households.

[Guaranteeing land ownership] We measured the percentage of people whose living environments that do not seem to be sustainable: people living in free housing or non-residential housing.

[Durability of housing] Durability of housing was evaluated in an indirect way by measuring residents' levels of satisfaction about physical conditions of the house.

[Enough living space] As data about "enough space" doesn't exist at the municipal level, we used national statistics.

2.1.1 How it works in Suwon

[Access to basic water] The households using shared bathrooms account for 0.5% (approx. 2,182 households) of the total households in Suwon, and the rate is the highest in Paldal-gu, recording 1.5%, followed by Kwonseon-gu and Yeongtong-gu. Households that do not have access to hot running water in their bathrooms account for 0.3% of the total. Gwonseon-gu recorded the highest at 0.7%, followed by Jangan-gu at 0.4%, Paldal-gu at 0.1% and Yeongtong-gu at 0.0%.

[Access to basic sanitation] The rate of households with no kitchen is 0.2% of the total. The percent was the highest in Paldal-gu, recording 0.8%, followed by 0.1% of Kwonseon-gu while all households in Jangan-gu and Yeongtong-gu have kitchen areas. The households using shared types of kitchens account for 0.3% of the total and the percent is the highest in Paldal-gu, recording 1.1%, followed by Jangan-gu at 0.4% and Kwonseon-gu at 0.1%. The percent of households that do not have flush toilets is 0.1% and households using shared types of toilets account for 0.9% of the total

[Guaranteeing land ownership] The rate of households living in free housing is 2.0%, while those living in non-residential building account for 3.5%.

[Durability of housing] We used the results of the questionnaire about elements of housing as an indicator of the durability of housing. The respondents were asked to mark their satisfaction levels about housing on a scale of 1 to 5, and the respondents gave 4.18, the highest, for structural safety followed by 4.16 for natural lighting and 4.15 for water leakage prevention. The most unsatisfactory elements among physical conditions of housing were soundproofing, marking 3.38, followed by 3.7 for moisture/fungus prevention and disaster preparedness and 3.74 for housebreaking prevention.

[Enough living space] Looked at the quantitative result instead of qualitative evaluation, you can see that the number of households below the minimum housing standards has decreased by 10.2% over 10 years from 16.6% in 2006 to 5.5% in 2016.

As a result of the review on the statistics of Suwon City regarding "ensuring access for all to adequate, safe and affordable housing and basic services and upgrading slums," we found that households living below the minimum housing standards account for 5.4% but it doesn't exactly mean that 5.4% of Suwon's population live in "inadequate housing" defined by UN-Habitat.

According to the indicators, the results show that Suwon citizens' access to basic water is well guaranteed as the rate of households using shared bathroom facilities is only 0.5%, and households without kitchen facilities and those using shared types of kitchen facilities account for just 0.2% and 0.3% respectively. In terms of access to basic sanitation, households without flush toilets account for

0.1% and the rate of those using shared types of toilets is as low as 0.9%. However, such rates are 3 or 4.5 times higher than the rate of households using shared types of bathroom or kitchen facilities. In case of land ownership guarantee, the rate of households living in free housing is 2.0% and those in non-residential building account for 3.5% of total households. Therefore, it is considered that the medium and long-term stability of housing is relatively in bad shape in light of the housing quality standards. As for housing durability, the results of the questionnaire about elements of housing show that the residents are highly satisfied with the durability of housing. However, the respondents expressed lower levels of satisfaction about structural safety, natural lighting, and water leakage prevention. Data on residential condition of Suwon suggests that the city's housing environments are generally great but *Paldal-gu* and *Kwonseon-gu* with highly concentrated old town areas show relatively poor outcomes compared to other districts like *Jangan-gu* and *Yeongtong-gu*.

2.1.2 What to do

Suwon's housing welfare policy needs to be divided into 1) improvement of the residential environment of those living in dilapidated housing, 2) reducing the economic burden of housing expenses, and 3) providing affordable and safe living spaces.

First of all, the city government is required to support the installation of modern kitchen facilities, flush toilets, and bathrooms with hot running water in order to improve the residential environment of those living in dilapidated housing. The city government needs to consider financial support for house remodeling and incentives for urban renewal projects to help those economically stricken families who cannot afford their own kitchen or toilet. More specifically, financial support for the establishment of a co-operative for home remodeling and subsidies for home remodeling works would inject vigor into the remodeling market and lead to tangible improvements of residential conditions. Given those who cannot use hot water due to the burden of the utility bill, utility vouchers could be a realistic solution. In addition, as a way of addressing inconveniences caused by shared types of toilets and kitchens, the adoption of floor area ratio (FAR) incentives for urban regeneration projects is worth considering to increase the economic feasibility of related projects.

Second, the expansion of public rental housing would contribute to reducing the economic burden of housing expenses. The most common public rental housing model, which is based on the benefits generated from housing site development, is no longer sustainable given the diminishing population. So, aside from the wide-spread model, the model of purchased rental housing should be constantly promoted. In addition, administrative and financial support, such as connecting public rental housing with Social Impact Bond (SIB), would motivate the private sector in terms of supply and maintenance of public rental housing.

Lastly, we need to take a broader approach to safe and affordable housing. Public rental housing has been the surest way of providing citizens with safe and affordable housing as the physical residential space has given people a sense of stability. However, not enough consideration has been made about jobs, leisure activities, and residential communities. In this regard, not only physical spaces but also residential programs for the promotion of jobs, leisure activities and residential communities should be taken into consideration for safe and affordable housing.

2.2 Review of Target 11.2

Target 11.2	By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons
Indicator 11.2.1	The proportion of the population that has convenient access to public transport, by sex, age, and persons with disabilities

The New Urban Agenda mentions the importance of transport mobility to create a sustainable city, and the role of local governments in achieving SDGs has been emphasized through the Paris Agreement, the Post-2015 Urban Agenda and Habitat III. Target 11.2 of SDG 11 emphasizes ensuring access to public transport systems for ensuring mobility of the vulnerable groups, and the progress and achievements will be measured based on the distance and travel time to access public transport services. While Target 11.2 of SDG 11 uses "proportion of population that has convenient access to public transport", as its indicator, this is also related to "Suwon 2030 Sustainable Development Goals" and especially its "Target 1-4: Increasing the Share of Public Transport for Ecological Transport and Improvement of Air Quality" of "Goal 1: Good Energy for All." In this regard, as Suwon currently does not have analyzed statistical data on the proportion of the population with access to public transport services. This paper made an attempt to suggest the data on the size of areas covered by bus service, which is estimated based on the locations of bus stops in the city. In addition, this paper considered to the alternatives that could secure the right of mobility handicapped and address the blind spots in terms of the time and spacing perspective.

2.2.1 How it works in Suwon

1) Removing blind spots for people without access to transport service

As data that quantifies the proportion of the population with convenient access to public transport has not yet been constructed, Suwon would like to suggest the size of areas covered by bus service which were analyzed based on the locations of bus stops in the city. The total area of Suwon is 121.14km², and the city is covered by 56.3% of green areas. The size of the built-up area (residential, commercial, industrial areas excepting the green area) is 52.98 km², accounting for 43.7% of Suwon and is composed of 43.13 km² (35.6%) of a residential, 5.73 km² (4.7%) of commercial, and 4.12 km² (3.4%) of an industrial area. The "Analysis of Areas Covered by Bus Service" was conducted for the whole area of Suwon including the densely populated built-up area and areas reachable on foot from bus stops (within 300 meters from the bus stop) were assumed as areas covered by bus service. The result shows that the size of areas covered by bus service, which are accessible to City bus routes in Suwon, is 74.3 km², which is equivalent to 61.4% of the total area of Suwon. The analyzed size of the areas covered by bus service based on the locations of bus stops is estimated to be 43.97 km² in the 52.98 km² built-up areas, which means the serviced areas account for 84.9% while 15.1% of the built-up areas are denied access to bus service.

Table 3. Bus service coverage in Suwon

Size of Suwon(km ²)	Serviced area(km ²)	Percent (%)
121.0	City bus: 74.3	61.4
	Non-stop Regional bus : 38.4	31.7
	General seated bus: 17.7	14.6

As of December 2017, Suwon has 128 bus routes, and 1,242 registered buses are in operation in the city. A total of 918 buses are running on 102 city bus routes and, of the 918 buses, there are 258 low-floor buses, accounting for 28% of the total. Suwon City set the standards on the design of bus stops in Suwon and applied the design to new Bus Shelters. The city may consider introducing the automatic folding chair, which won a prize at the Proposal Review Committee in the first half of 2013, to bus stops that lack spaces and are used by many vulnerable individuals. The city set the goal of increasing the distribution rate and the number of low-floor buses to 32% and to 310 vehicles by the target year of 2021.

Table 4. Current status and plan of Low-floor buses in Suwon

Item	Nation-wide distribution rate	Distribution rate of low-floor buses in Suwon as of 2017			Targeted distribution rate of low-floor buses in Suwon by 2021				(B-A)
		Total number of city buses	Number of low-floor buses	Distribution rate	Gyeonggi Province (A)	Suwon City (B)	Target number	Number of low-floor buses to be added	
Low-floor bus	19.0%	918	258	28%	32%	32%	310	52	-

2) The spread of Special Transport Service (STS) vehicles

The purpose of Special Transport Service (STS) is to provide mobility handicapped with an access to public transportation and ensure them travel safely and conveniently, thereby promoting their participation in society as well as their well-being. As of 2018, a total of 123 STS vehicles are in operation and it is far exceeding the legal requirements. However, a lots of problems associated with STS such as discomfort, an unkindness of drivers, the inconvenience of sharing the space with many other passengers and others who travel in the same direction, should be addressed from the viewpoint of STS users. It is also important to advertise the Mobility Support Center to attract more STS users.

Table 5. Legally required number of STS vehicles for Suwon

Number of people with disabilities				Legal requirements	
Grade 1	Grade 2	Grade 3	Total	Number of people with disability grades 1-2	Number of legally required STS vehicles
3,444	5,555	7,067	16,066	8,999	45

Table 6. Plan on the adoption of STS in Suwon

Year	Estimated number of people with disabilities				Number of required STS vehicles			Plan on STS vehicles	
	Grade 1	Grade 2	Grade 3	Total	Number of People with disability grades 1-2	Number of required vehicles	Number of vehicles to be added	The current number of STS vehicles	
2018	3,444	5,554	7,066	16,064	8,998	45	10	88 (133)	
2019	3,443	5,554	7,066	16,063	8,997	45	-	88 (133)	
2020	3,443	5,553	7,065	16,061	8,996	45	-	88 (133)	

3) Measures to remove blind spots in terms of operating hours

For weekdays, late-night buses run on the road for a total of 48 times on 8 bus routes, and bus route 7770, which is operated until the latest time, runs on the route between Suwon Station and *Sadang* Station and is operated until 04:30 a.m. on the last stop. When it comes to the late night service, Suwon is required to analyze the demand which could be calculated the number of passengers who get on and off from the bus from 22:00 to 24:00 based on data of transport card usage and visualizing data to create bus routes around the bus stops.

4) Measures to eliminate blind spots from spatial perspectives.

Spatial blind spots in Suwon are found in areas around the Suwon Industrial Complex and on the outskirts of Suwon due to the lack of accessibility to bus service. As the Ministry of Land, Infrastructure, and Transport revised the Enforcement Decree of the Act on Passenger Transport Service to allow small and medium-sized enterprises, who cannot afford their own commuter buses, to benefit from sharing of commuter buses, it is also worth considering the adoption of such type of commuter bus operation in Suwon as Suwon Industrial Complex I, II and III were included as permitted areas for the common use of the commuter buses. Furthermore, for the convenience of citizens, the city government needs to move towards flexible demand-responsive public transport services in terms of routes, operating hours, and frequency of operations, especially for areas on the outskirts of the city which lack access to public transportation.

2.2.2 What to do

In this chapter, we have mainly focused on solutions to blind spots in terms of time and space for the mobility disadvantaged in order to "provide access to safe, affordable, accessible and sustainable transport systems for all" in line with Target 11.2 of SDG 11.

We assume that the suggested data based on the locations of bus stops in Suwon could replace "data on the proportion of the population that has convenient access to public transport". However, producing such data on a regular basis is accompanied by many challenges. So, it can be considered to use the "Share of Public Transport" in Target 1-4 of Suwon SDGs as an indicator. The number of STS vehicles in Suwon, which is mainly used by people with disabilities, is equivalent to 173% of the standard, far exceeding the legal requirements, and the city plans to increase it to 200%. The number of STS vehicles and the number of adopted low-floor buses should be also selected as indicators of mobility of vulnerable groups or individuals. To address inconveniences facing general public transport users such as limited hours or not enough coverage of public transport service, the city needs to consider expansion of late-night buses and adoption of demand-responsive public transport service at

late night hours as well as the bus reservation system for overcrowded bus routes. On the other hand, opening more bus routes around the areas on the outskirts of the city and the Suwon Industrial Complex also need to be considered to increase the coverage of public transport service. Above all, in order to "provide access to safe, affordable, accessible and sustainable transport systems for all", Suwon needs to develop its own indicators of evaluating minimum public transport services in the local context of the city and improve the overall public transportation service.

2.3 Review of Target 11.3

Target 11.3	By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries
Indicator 11.3.1	The ratio of land consumption rate to population growth rate
Indicator 11.3.2	The proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically

The indicator of "ratio of land consumption rate to population growth rate(Indicator 11.3.1)" is to ensure sustainability of expansion of urban areas and urbanization. Population growth rate refers to the rate, expressed in percent, at which the number of individuals in a population increases in a given time period (usually one year) while land consumption rate is defined as the rate of the land used for the expansion of built-up area which can be directly measured; exploitation by agriculture, forestry or other economic activities; and over-intensive exploitation for agriculture and forestry. As the Republic of Korea has constructed annual statistical data on land use changes since 2007(Cadastral Statistics of the Ministry of Land, Infrastructure, and Transport), the data can be used to calculate the ratio of land consumption rate to population growth rate.

The Indicator "11.3.2: Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically" is for assessing the capacity and building blocks for citizen participatory sustainable urban policy. It is expected that this indicator will take considerable time to be used because the tasks of concept definition and metadata construction are not completed. In Korea, there has been a constant discussion on the establishment of citizen participatory governance for urban planning and management, and Suwon City has been leading the efforts of involving citizens in urban planning with its Team of Citizen Planners and the Village Renaissance Project.

Suwon City set the 10 Sustainable Development Goals of Suwon (or Suwon 10 SDGs) which cover 3 areas and are comprised of 10 goals, 57 targets and 133 indicators. Among them, Suwon SDGs' "Goal 9: Sustainable City and Culture for All" and "Target 9-1: Urban Management Based on Capacity of Urban Environments and Ensuring Access to Basic Services" are closely related to "inclusive and sustainable urbanization".

2.3.1 How it works in Suwon

1) Status of Suwon regarding "Indicator 11.3.1: the ratio of land consumption rate to population growth rate" and self-evaluation

Data on land use by land category provided by Statistics Korea refer to the population growth rate and land consumption rate of Suwon. In 2016, the population of Suwon shows an 85.1% increase from that of 1990, and the size of building sites(an 82.5% increase compared to 1990) and roads have increased significantly(a 99.6% increase compared to 1990). On the contrary, the areas of dry fields and paddies have decreased by 31.3% and 45.0% respectively. Forest land areas have also decreased by 18.6%.

Table 7. The Population of Suwon and the land use ratio

Category		1990	1995	2000	2007	2010	2013	2016
Population		644,968	746,610	948,065	1,067,702	1,077,535	1,148,157	1,194,041
Dry field	Km ²	11,416	14,007	12,020	10,207	10,012	8,981	7,846
	%	10.8	11.6	9.9	8.4	8.3	7.4	6.5
Paddies	Km ²	20,065	24,747	20,642	16,667	15,884	14,072	11,035
	%	19.0	20.4	17.0	13.8	13.1	11.6	9.1
Forest	Km ²	31,875	34,808	31,764	30,142	29,831	26,585	25,955
	%	30.2	28.7	26.2	24.9	24.7	22.0	21.4
Building site	Km ²	17,532	19,354	23,124	26,531	26,982	29,642	31,989
	%	16.6	16.0	19.1	21.9	22.3	24.5	26.4
Factory site	Km ²	1,973	2,841	2,750	3,191	3,363	3,037	3,469
	%	1.9	2.3	2.3	2.6	2.8	2.5	2.9
Roads	Km ²	7,485	8,603	10,579	12,436	12,931	14,014	14,939
	%	7.1	7.1	8.7	10.3	10.7	11.6	12.3
Park	Km ²	557	620	1,494	2,096	2,178	4,874	5,852
	%	0.5	0.5	1.2	1.7	1.8	4.0	4.8
Total	Km ²	105,562	121,221	121,128	121,065	121,008	121,048	121,054
	%	100.0	100.0	100.0	100.0	100.0	100.0	100.0

2) Status of Suwon regarding "Indicator 11.3.2: Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically" and self-evaluation

In the absence of a specific methodology for the indicator, maybe it is too early to evaluate Suwon in light of Indicator 11.3.2. However, one clear thing is that Suwon City has prepared a variety of channels for civil society's participation to realize a sustainable city, regarding policy proposal, budget allocation, policy planning, policy enforcement and conflict settlement.

In terms of policy proposals, there are the Good Municipal Affairs Committee, Citizen Opinion Contest and the Round Table Discussion of 500. The Good Municipal Affairs Committee checks the implementation status of promising projects that were suggested as election pledges. Since its launch in February 2011, the committee, comprised of experts and members of civil society, has been holding regular meetings to realize the goal of citizen-led self-government. Citizen Opinion Contest, which started in 2010, allows citizens suggest policy ideas or plans, and the winners are provided with financial support to directly implement the ideas. The Round Table Discussion of 500 provides an opportunity for 300-500 citizens to express their opinions about major issues of the city.

In terms of budget allocation, citizens can participate in the budgeting process through the "Citizen Participatory Budget System." The system helps citizens directly take part in the budgeting process, and their ideas are reviewed and coordinated to secure transparency of administration and to strengthen participatory democracy. The Team of Citizen Planners started in 2013 as 130 adults and 100 teenagers participated in the establishment of the Basic Plan on Urban Planning of Suwon 2030 and they have provided a reasonable decision-making method for major policy issues of the city. The number of participants has increased to 300 adult citizens and 300 teenagers. Suwon citizens can directly run a program to strengthen communities and improve living environments of villages through

the "Village Renaissance Contest." Since its inception in 2011, a total of 809 projects have been implemented by October 2017 through the contest.

Citizen Juries, as a citizen participatory system, make fair and objective solutions to major policy issues that are closely related to citizen's life and solve previously unresolved or repeated conflicts through public debate and deliberation. Recently, Gwanggyosan Council for Conflict Resolution settled the disputes about the Gwanggyo water source protection area. A number of stakeholders including local residents, civil society, experts, and Suwon City officials discussed this issue for eight months from August 2017 before the final agreement was reached in February 2018.

Table 8. List of Participatory policies of Suwon

Category		Conceptual characteristics	Participatory characteristics	Operational characteristics
Policy suggestions	Good Municipal Affairs Committee	-Monitoring execution of promised projects (election pledges) -Developing new policies	-Governance mechanism based on an ordinance -A channel for various participants including experts, public officials, and citizens	-Regularly held -Direct operation -The plenary and five specialized committees
	Citizen Opinion Contest	-Public contest for citizens' policy proposals -Suggesting ideas and conducting policy experiments	-Open to Suwon citizens and employees of companies in Suwon and students attending schools in the city	-Regularly held once a year -Consignment operation -The public contest, experiments, and evaluation
	Round Table Discussion of 500	-Intensive discussion on major municipal issues	-One-time discussion on policy	-Usually held once a year, adjustable depending on the case -Consignment operation -Roundtable discussion of all participants
Budgeting	Citizen Participatory Budget System	-Some portions of municipal budget allocated by citizens	-Organization for citizens' participation based on ordinances -Participation of teenagers	-Regularly held once a year -Direct operation -Applied to whole districts
Planning	A team of Citizen Planner	-Citizen participation in the process of establishing the Basic Plan on Urban Planning of Suwon(legal planning) -Expanded participation in urban policy issues	-Organization for citizens' participation based on ordinances -Comprised of 300 adult citizens and 300 teenagers	-Officially held once a year -Consignment operation -Roundtable discussion of all participants
	Village Planning Team	-Involving residents from each administrative unit or "dong" in the process of establishing village plans	-Short-term project group -Participated by about 20 people in each dong	-Temporarily held in 2013 and 2015 -Consignment operation / roundtable discussion in each "dong"
Policy enforcement	Village Renaissance	-Resident-led development of villages -A kind of citizen campaign for a stronger community and better living environments	-Governance organization based on ordinances -Residents voluntarily form a group to apply for open contests	-Participation throughout the year -Consignment operation (Suwon Sustainable City Foundation) -Education, benchmarking, public contests, consulting, etc.
Conflict management	Citizen Juries	-Non-judicial coordination system for mediation of public-private and private-private conflicts	-Recruitment and selection of juries based on ordinances -Submitting applications for mediation of conflicts -Citizens participate as applicants or juries for reasonable judgment	-Voluntary participation of citizens -Consignment operation -Determination of subjects for deliberation and operation of the trial court for citizen Juries
	Gwanggyosan Council for Conflict Resolution	-A consultative body for resolution of conflicts between residents of the water source protection areas, civil society, and Suwon City	-Participated by 20 people including residents, members of civil society groups, experts, city councilors and public officials	-Temporary operation -Governance system -Discussion for conflict resolution

2.3.2 What to do

1) The focus of policy moving from development to sustainability

In 1970, the population of Suwon and that of Gyeonggi Province were 167,201 and 3,296,950 respectively, and the population of the country was 30,882,386. As of 2016, the population of Suwon is 1,207,032, that of Gyeonggi Province, 6,405,301, and the national population is 51,269,554. The rapid increase in the population of Suwon was possible since the city was conveniently located to use transport services and the demand for development was high as the city, at that time, was mainly made of flat areas filled with dry fields and rice paddies. As mentioned above, the urban area of Suwon hasn't changed much since 1990 but dry fields and paddies have decreased by 31.3% and 45.0% respectively compared to 1990. On the contrary, the building site area and roads have increased by 82.5% and 99.6%. Recently, as large-scale new town development projects are being carried out in areas that were previously limited development districts (Homaesil and Gyanggyo), many dry fields and paddies in the southern part of Suwon are turning into multi-unit housing. Such development-oriented land use is accompanied by an increase in the urban temperature, such as heat island phenomenon caused by an increase in impermeable surfaces. In addition, it is also closely related to sustainability issues, such as depletion of groundwater, floods and pollution and destruction of biological habitats as well as the issue of life quality. Given that, it is time to take more sophisticated approaches, moving the direction of urban policy towards regeneration of declining old towns rather than haphazard land development in suburbs, and eco-friendly measures, such as securing natural green spaces in the city center, should be promoted.

2) The pursuit of citizen participatory policy and the need for setting appropriate indicators

In addition to the policies introduced above, Suwon City announced the "Suwon Declaration on Human City" in 2017 with its commitment to the people-oriented urban policy. With the concept of the "Government for Suwon Citizens," Suwon City pursues the realization of citizen-led self-government and direct democracy. Activities and projects conducted by Suwon City include Citizens' Autonomous University, Citizen Participatory Online Platform, Citizen Discussion Forum, Communication Box, Apartment Democracy, Promotion of Shared Economy, Policy Debate in Agora, Youth Council, Survey on Human Rights Impacts and Dream Playground for Children with Disabilities. The citizen participatory policy in Suwon has been evolving with the constant support of citizens, administrative efforts, and cooperation between civil society and experts for new governance systems. It would be no exaggeration to say that Suwon is a leading city in Korea in terms of citizen participatory policy. However, the city needs not only administrative and financial support but also indicators for measuring and monitoring the progress made in achieving citizen participatory policy, to further promote the participation of citizens, civil society, and experts. As the clear methodology for "Indicator 11.2.3: Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically" is not available, it deems necessary to develop indicators for measuring the performance at the local/municipal level for the promotion of citizen participation.

2.4 Review of Target 11.4

Target 11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage
Indicator 11.4.1	Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)

The indicator is closely related to "Suwon, City of History and Culture", the key phrase that became the final choice among other candidates to capture the characteristics of the city according to the Survey on Public Awareness of Sustainable Development in Suwon. It shows how important historical and cultural elements are for the sustainable development of Suwon.

Target 11.4 of SDG11 is linked to "Goal 9: Sustainable City and Culture for All" set by Suwon Council for Sustainable Development and "Target 9-4: Guaranteeing Cultural Accessibility through Sustainable Cultural Policy" and also "Target 9-5: "Promoting Cultural Enjoyment and Civic Culture" which were detailed by Suwon City.

SDG 11 is to secure the sustainable human settlements that are concentrated in cities, which could be interpreted as strengthening the elements that have been regarded as benefits of cities. However, the two concepts of sustainability of cities and the protection of cultural and natural heritage have been at odds with each other in the conflicting values between development and protection. Therefore, it seems important for Suwon to promote its own policies and indicators while striking the right balance between the two concepts.

Suwon City has been implementing policies to create the Sustainable City and Culture for All. In relation to Indicator 11.4.1, Suwon has set policy directions such as promoting heritage protection, conducting studies on heritage on a constant basis, expanding basic infrastructure for cultural enjoyment, restoration of cultural properties, the creation of the 'heritage trail' and storytelling for cultural heritage.

2.4.1 How it works in Suwon

1) The status of cultural property of Suwon

[Budget] In case of Suwon, the budget for culture and tourism accounts for about 8% of the total budget. It is difficult to compare the national GDP or government budget with the Suwon city government's budget, but it is clear that the budget for culture in Suwon takes up a larger proportion of the total municipal budget compared to other cities. In particular, the ratio of the budget for culture and tourism in Suwon is relatively high compared to Gyeonggi Province's metropolitan municipalities and other municipal governments that have a population of around 1 million people. Suwon invests a considerable amount of its budget into culture and tourism even comparable to cities such as Gyeongju and Andong.

[World Cultural Heritages] Suwon *Hwaseong* Fortress was listed as a World Heritage Site by UNESCO in 1997. As a fortress and a new city built in 1796, *Hwaseong* Fortress was designated as the Historic Site No. 3 and registered as Designated National Heritage in 1963 and as a World Heritage Site

(UNESCO) in December 1997. Suwon City is dedicated to the restoration and maintenance of Suwon *Hwaseong* Fortress through efficient management and improvement of facilities in the fortress.

The *Hwahongmun* Gate of Suwon *Hwaseong* had been repaired and restored many times from 1848 to 1922 due to the damage by heavy rains. While having undergone repeated repair and restoration works, Suwon *Hwaseong* had been a constant concern for the city's residents and communities for around 100 years.

Chukman Reservoir in Suwon was designated as the Gyeonggi Provincial Monument No. 200 in 2005 and was added to the list of Heritage Irrigation Structures (HIS) in 2016. The International Commission on Irrigation and Drainage (ICID) has been adding more than 100-year old irrigation structures that contribute to the development of irrigation and agriculture to the list of HIS to study and utilize historically, technologically and socially valuable structures since 2014.

In 1799 (23 years in the reign of King Jeongjo), King Jeongjo invested 30,000 *Nyang* (a unit of currency) from his privy purse into the construction of the *Chukman* Reservoir, with the goal of improving people's livelihoods and expanding irrigation facilities. *Chukman* Reservoir was designed to expand the agricultural base of the new town of Suwon and turn it into a self-sufficient city, and later modern agriculture facilities were built around this area during the period of Japanese colonial rule.

2) The status of regulation on land use in Suwon

Suwon City set up 58 regulation items on land use to be applied to the land of 622,817,841 square meters. Twelve out of 58 items seem to be related to heritage conservation from both short-term and long-term perspectives. The 12 items are intended to preserve cultural resources and the Designated Historic and Cultural District, and protect wildlife in Designated Mountainous Districts for Public Interest. The most important part of the regulation is the Limited Development District and Designated Mountainous Districts for Public Interest as well as the regulation items on the Area within 500 Meters of Designated National Cultural Heritage and the Area with Potential Impact on Preservation of Cultural Heritage.

Data on land use regulation is constructed to provide spatial information services to citizens and can be used to prevent and inhibit haphazard urban development in response to growing urbanization. It can also contribute to the provision of spatial information for heritage protection.

3) Expansion of basic infrastructure for culture in Suwon

Suwon city has been committed to guaranteeing citizens' accessibility and cultural enjoyment through expansion of cultural infrastructure in line with "Sustainable City and Culture for All." Suwon accounts for 1.3% of the nation's cultural infrastructure, but the city, as a relatively small municipal government, is on par with other metropolitan municipalities such as Gwangju, Daejeon and Ulsan, Suwon in terms of the number of cultural facilities.

Libraries take up the largest share among all cultural facilities in Suwon. The city, with the goal of making libraries reachable by foot within 10 minutes from anywhere in the city, has created a good reading environment and platforms of information for citizens, especially for vulnerable groups.

4) Status of cultural heritage protection in Suwon

[*Hwaseong Haenggung* Palace & Fortress] Since the beginning of the restoration work of Suwon *Hwaseong* Fortress in 1976, Suwon has been devoted to the restoration of Suwon *Hwaseong* Fortress and the *Hwaseong Haenggung* Palace which was designated as a UNESCO World Cultural Heritage Site in 1997 for around 40 years up until now.

Since the first restoration work, Suwon has continued the restoration efforts for unrestored facilities. As a result, the Namsumun (or South Floodgate of Suwon Hwaseong) was restored in 2016 and Suwon recently found the remains of the foundation of the Advisory Council (Yia/貳衙) building which was used as the second building of Hwaseong Yusubu (Hwaseong Commandery/華城留守府) where judges worked for the Magistrate of Suwon during the Joseon Dynasty.

The restoration project of the Hwaseong Haenggung Palace was carried out in connection with the restoration of Suwon Hwaseong Fortress. After undergoing the first phase of the restoration project from 1989 to 2002, the project entered the second phase in 2003 and will be completed by 2020. The biggest challenge in the restoration process so far has been the relocation of Shinpoong Elementary School. The school was established in 1896 and has shared 100-year history with Suwon. So the city government of Suwon persuaded residents about the need for school's relocation through parent briefing sessions and a number of meetings with resident representatives, to restore the important cultural assets of Suwon.

With the conflicting interests between the restoration of the traditional cultural asset and the recent 100-year history in the modern era. Suwon had actively sought a solution and persuaded opposing stakeholders by holding public hearings and delivering presentations.

[Restoration of Bugukwon] The old building of Bugukwon, which was designated as Suwon's Local Relic No. 19, was built in 1916 and has more than 100-year history. Although the building is old, it did not undergo any renovation or repair and the original shape of the building has been kept.

Following the designation of the building as Suwon's Local Relic in 2006, the lack of sufficient financial support from Suwon City for the preservation of the building, caused conflicts with the building's owner, who was restricted in the exercise of property right. However, it became an exemplary case of resolving the conflicts that arise from the costs incurred in the implementation process of the policy for cultural property protection.

The implementation process for the preservation of Bugukwon: Bugukwon was a demonstration of the conflicting interests between preservation of a valuable asset of the community and the fundamental right specified in the constitution: the right of ownership. The Suwon city government actively intervened to solve the problem and smoothly settled the conflicts. Such active engagement of the city government bears significant meaning as one of the cases that shows the smooth incorporation of privately-owned cultural heritage into the systematic management by the engagement of the government.

[Special Tourism Zone and creation of the Heritage Trail] Since the launch of the project of creating the Heritage Trail in 2016, Suwon has been focused on the creation of the Tourism Belt by making more Heritage Trails and utilizing its cultural resources and major tourist attractions such as Suwon Hwaseong.

Such project is part of the efforts to identify and preserve the modern cultural heritage that is worthy of being handed over to future generations. Furthermore, the modern heritage is in danger of disappearing with the expansion of infrastructures such as housing, roads, and public transportation for stable urban growth.

Suwon created the Heritage Trail along modern cultural assets in 4 districts and has been using storytelling to engage the public's interest in cultural heritage. We have been studying historical and cultural resources of Suwon based on the main characteristics of the 4 districts: Suwon Hwaseong

Fortress; the area around Suwon Stream; Gyo-dong; and Seodun-dong while working on making stories with themes based on rich stories that have been accumulated over time.

2.4.2 What to do

The primary goal of Target 11.4 is to “strengthen efforts to protect and safeguard the world’s cultural and natural heritage” from being destroyed by urban development. Suwon City is also focused on setting up plans for cultural heritage management to make a sustainable city.

Especially, Suwon City concentrated on preservation, protection, and research of the World Heritage Site of Hwaseong Fortress, which gives the identity of new town to Suwon, and such efforts led to achievements represented by the restoration of Suwon Hwaseong Fortress and the Hwaseong Haenggung Palace, and the World Heritage Site has been well-maintained in spite of the transitional period of rapid urbanization and modernization.

On the other hand, Suwon has been expanding the scope of its work to go beyond the cultural preservation of the World Heritages. Suwon is securing modern cultural resources by creating the Heritage Trails along modern cultural assets and, as part of efforts to share the history with citizens, Suwon has been using storytelling to engage the public's interest in cultural heritage.

On the contrary to the pre-modern era where the ruler-centered historical records and cultural heritage were dominant, it is time for us to encourage citizens to take part in the protection of cultural heritage with pride as members of the society and also producers, consumer, and distributor of our common assets. As cultural heritage reflects people's past, present, and the future, cultural heritage can be identified with people themselves. Protecting cultural heritage, therefore, serves as a way for people to respect their own history. In addition, cultural heritage protection is key to making Suwon, the city where they live, a more sustainable one.

2.5 Review of Target 11.5

Target 11.5	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to the global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations
Indicator 11.5.1	Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
Indicator 11.5.2	The direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters

Suwon is located in the inland area of the country and the level of damage from disasters like tsunamis is relatively low. Therefore, Suwon Sustainable Development Goals (Suwon SDGs) do not include contents related to Target 11.5. However, Suwon also makes official announcements of the death toll, the number of people affected, the size of the affected area and the amount of damage by disasters such as heavy rains. While it is important to make use of indicators that show the degree of damage caused by disasters at the national level, promoting preventive measures and building capacities for disaster response are essential elements in increasing resilience from disasters. There is a limit for applying indicators of national-level disasters to cities. Therefore, cities need to come up with their own measures and indicators to increase resilience and evaluate the damage by disasters.

2.5.1 How it works in Suwon

1) The status of damage by disasters in Suwon

In case of disaster damage in Suwon, heavy rains are the primary cause of disaster damage compared to others i.e. heavy snow, storm, strong winds, earthquakes, and typhoons. The overflowing river and inundation caused by heavy rains account for the largest proportion of total property damage in Suwon. On the contrary, typhoons cost the biggest damage at the national level. The number of people affected by heavy rains in Suwon stood at 496 households with 1,162 people in 2012 and has shown a steady decline. The indicator of the number of affected people per 100,000 population has been also on a downward trend. The total amount of damage fell sharply after recording over KRW 1.5 billion in 2012 and recorded KRW 200 million in 2016 due to the overflowing river and inundated buildings. The decrease in the number of people affected by the disaster and the total amount of damage was made possible by improving the sewage treatment system to have a more flow-dividing structure and installing more street inlets and other appurtenances to prevent reflux.

Table 9. Damages from a natural disaster in Suwon

Year		2012	2013	2014	2015	2016
Total number of affected households/persons		496 / 1162	11 / 29	20 / 41	15 / 32	0 / 0
Number of persons	Death	0	0	0	0	0
	Missing	0	0	0	0	0
	Injury	0	0	0	0	0
	Total	0	0	0	0	0

Total number of affected persons per 100,000 population	101.22	2.46	3.39	2.62	0
Total amount of damage (unit: 1,000 won)	1,586,704	6,600	12,000	9,000	215,676

Source: annual disasters reports of 2012, 2013, 2014, 2015 and 2016

2) The status of vulnerable groups in Suwon

As of 2015, the number of elderly people aged 65 and over, who are considered to be vulnerable to disasters, was 122,631 or 10.47% of the total population while the number of children aged 5 and under was 71,798, accounting for 6.13%. With the increasing number of people aged 65 and over, the number of elderly citizens living alone in Suwon has been also on an upward trend, totaling 24,962, and 18,080 people from 12,855 households are recipients of national basic livelihood guarantees. Suwon was home to 374,008 households as of 2010. As for the types of housing, the most common type was apartment accounting for 49.49% followed by detached housing recording 36.94%. The number of households in underground housing was 18,345, and many of them were distributed across districts like Jangan-gu, Paldal-gu and Gwonseon-gu. Suwon City recommends citizens take out storm and flood insurance to facilitate the compensation and recovery process in the wake of natural disasters. In addition, the city is also working on the prevention of disaster damage through various policies such as supportive housing programs.

3) The status of disaster management in Suwon: policy for enhancing resilience

The existence of a master plan on disaster response is used as an important indicator to reduce the number of affected people and economic losses by disasters. Nevertheless, practical action plans and procedures are still more important than a master plan to strengthen capabilities for disaster response and to protect citizens from disasters. Therefore, it is important for the municipal government to secure relevant systems, manpower, and budget.

[Vulnerable People] The city offers supports for healthcare and social participation of vulnerable groups on a regular basis, not just in times of disaster. Especially, the city is trying to provide residents, especially those in vulnerable groups, with quality residential spaces.

[Basic Service Infrastructure] The distribution rate of sewerage pipes recorded 91.3% with the length of constructed pipes reaching 1,873,483m out of the planned length of 2,050,387m. In case of the old downtown areas such as *Paldal-gu*, unclassified pipes take up the largest proportion of the total pipes in the district. Suwon is responding to floods and heavy rain with disaster relief facilities including seven drainage pumping stations and five retention basins.

Table 10. River maintenance in Suwon

	Jangan-gu	Gwonseon-gu	Paldal-gu	Yeongtong-gu
Small River Maintenance Act	9 small rivers	8 small rivers	-	7 small rivers
River Act	7 local rivers			
	-	2 water level observation towers	1 water level observation tower	1 water level observation tower
	-	3 drain pump stations	1 drain pump station	3 drain pump stations

National Land Planning and Utilization Act	-	Assessment on the Gwonseon District Development Project and Impact on Disaster 3 permanent detention ponds	Assessment on the Gwanggyo Residential Area Development Project and Impact on Disaster 1 permanent detention pond	Assessment on the Gwanggyo Residential Area Development Project and Impact on Disaster 1 permanent detention pond
Sewerage Act	Sewer pipe (349km)	Sewer pipe (457km)	Sewer pipe (345m)	Sewer pipe (297km)
Suwon Sewage Treatment Plant				

Source: 2012 Report on Damage by Flood by Korea Land and Geospatial Information Corporation

[Green infrastructure] Suwon has seen an increase in impermeable surfaces due to the rising number of development projects accompanied by urbanization and industrialization. In addition, the likelihood of regional inundation and flooding increased with the changing patterns of rainfall caused by climate change. Especially, water circulation occurs in less areas with decreasing evapotranspiration rate due to shrinking farmland and green areas. In this regard, effective rainwater management is essential through rainwater harvesting, utilization, storage and infiltration. Equipment or facilities for rainwater utilization have spread from public buildings to citizens through the spread of rainwater containers to general households. Besides, in addition to sewer pipes, permeable blocks and pavements have been installed to make rainwater penetrate into the soil. Suwon City plans to build a GIS-based integrated management system which will provide various information related to Rain City Project of Suwon as well as real-time monitoring and integrated management of rainwater utilization facilities.

2.5.2 What to do

Located in the central inland area of the country, Suwon is a relatively safe city from the impact of disasters such as earthquakes and tsunamis. However, the city is not free of the potential risks of floods and typhoons and is required to prepare for urban flooding given the four streams straddling the south and the north of the city. Indicators of Target 11.5 of SDG 11 requires local/municipal governments to suggest data on the current disaster damage status. However, there is a limit to setting policy directions based on such indicators. So, local/municipal governments are required to set their own indicators to evaluate both the current disaster damage status (and Status Indicators) and policy responses to disasters (Response Indicators). The Response Indicators will show the level of responses to disasters and be used to suggest relevant policies and secure budget and manpower. However, a clear methodology for selection and calculation for indicators has not been prepared and requires additional research. Nevertheless, there is a need to make the public debate on the Response Indicators to enhance resilience from disasters. Suwon is said to be a relatively safe city from disasters, but it should not be an excuse for complacency. Although the frequency of typhoons and heavy rainfall cannot be curtailed by urban policy, Suwon should lay the solid foundation for disaster resilience through fundamental solutions such as expanding permeable pavements and building green infrastructure.

2.6 Review of Target 11.6

Target 11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management
Indicator 11.6.1	The proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities
Indicator 11.6.2	Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population-weighted)

Target 11.6 aims to reduce the adverse per capita environmental impact of cities by addressing the overall urban environmental pollution. In case of South Korea, urban solid waste is treated after being divided into waste for recycling, waste for incineration and for disposal in landfills. Households buy plastic garbage bags to discharge waste (according to the Volume-rate Garbage Disposal System introduced in 1995), and the government collects all of them for treatment. Recyclable garbage is discharged after being sorted by type and is collected by specialized companies in treatment and recycling. Under the circumstance, it is not appropriate for South Korea to apply Indicator 11.6.1. as the rate of properly treated urban solid waste has been 100% since 1990. Therefore, it was proposed to use the "amount of generated waste" as an alternative indicator and this report reviewed it.

The data on annual averages of urban particulate matter (PM) has been accumulated based on PM 10 since the 1990s. On the other hand, the official measurement based on PM2.5 has been officially conducted for the statistical purpose since as recently as 2015. Seoul and the Gyeonggi Province, which includes Suwon, account for 5% of the entire territory of the Republic of Korea while they are home to 44% of the nation's total population. Suwon is a very densely populated city with its population density reaching 10,000 people per km². That explains why Seoul and the Gyeonggi Province were designated as the Seoul Metropolitan Area for Special Management of Air Quality. As such, populated areas have been policy priorities and the weighted influence based on the number of population is well recognized.

It is understandable that water environmental quality is excluded from SDG 11 as tackling the issue requires not only the efforts of cities but the entire world. However, in this paper, we will look into the progress made in improving the water quality of Suwon's major streams as the four streams, which flow through the entire city and are adjacent to residential and living spaces, play such an important role in improving the living standards of citizens' lives.

The data regarding the abovementioned indicators has been accumulated as official statistical data at the level of Suwon City as well as the national level and various efforts have been made on the policy front. For example, 'Suwon 2030 Sustainable Development Goals' were set by collecting various opinions from civil society by Suwon Council for Sustainable Development, and set the Targets in line with UN indicators such as energy conservation, improvement of air quality, reduction of carbon emissions, reducing consumption, and waste reduction.

2.6.1 How it works in Suwon

1) Solid Waste

The daily amount of Suwon's urban solid waste is around 1,000 tons per day. Although the city's population has steadily increased by 13% over the past decade, reaching 1.23 million in 2016, the urban waste has not gone up. Such achievement is attributable to the nation-wide adoption of the Volume-rate Garbage Disposal System (in which the cost of garbage disposal is charged in advance, ranging from 300 won to 600 won per 20 liters) and the Suwon's policy on separate garbage system for recycling. All of the non-recyclable garbage is treated at an incinerator located in the city and they account for 48% (10-year average) of the total amount of urban solid waste. In both scenarios where the city's population reaches 1.3 million or stays at the status quo, Suwon City needs to focus on cutting the total amount of urban solid waste and air pollutants emitted from incinerators rather than enlarging their capacity.

In case of Korea, food waste is separated from waste to be incinerated, and citizens purchase plastic bags to discharge food waste to designated places on the roadside. Residents of apartment buildings discharge food waste in a common food waste bin located in the apartment complex. Due to the nature of Korean food with high water content, the food waste collected from the detached housing in summer can be malodorous. To solve this problem, local governments regularly clean the food waste bins and the site with water while collecting it.

As such, waste is separated into different types from the point of discharge: waste for recycling; waste to incinerate; or food waste. If the waste is not properly separated by type or the designated waste bag is not used, the waste collection would be delayed leading to deteriorated hygiene on the roadside. Therefore, Suwon uses CCTV and sensors, sends warning messages or make notices about violation cases to prevent fly-tipping. Suwon also provides foreigners who may not be familiar with the city's waste disposal policy with leaflets written in major foreign languages. The city government also provides free waste bags to low-income households to ease the economic burden on them.

2) Particulate Matter: PM 2.5 and PM 10

The concentration levels of PM10 in seven Korean metropolitan cities and Suwon had decreased between 2007 and 2011, and have been maintained ever since 2012. The PM10 concentration level in Suwon is similar to those of other metropolitan cities, but its absolute value is relatively high. As Suwon has a basin-shaped terrain located in the western part of the Korean Peninsula, pollutants accumulate easily and the dilution effect by diffusion is low. As the statistics on PM 2.5 have been built since 2015, with only two years of data, it is too early to understand the whole patterns. Suwon is focused on continuous management of 2.5 PM as the annual average of Suwon exceeded the national environmental standards for PM 2.5 in 2016, and Suwon's PM 2.5 level is higher than the standards recommended by WHO (which is 50% of EU standards) and US standards.

The PM 2.5 concentration levels in Suwon are higher in winter and early spring than in summer. Such phenomenon is attributable to increased use of fossil fuel, low temperature, frequent atmospheric congestion, and the influx of air pollutants from China with a northwesterly wind. According to the Gyeonggi Province Air Pollution Assessment Report 2016, daily average concentration levels of PM10 and PM 2.5 (based on the 99th percentile) in Suwon failed to meet the standards by recording 122 $\mu\text{g} / \text{m}^3$ and 59 $\mu\text{g} / \text{m}^3$ respectively. However, not only Suwon but also many of 31 cities and counties in Gyeonggi Province also did not reach the standards. The rates of cities and countries that achieved the daily averages were 0% for PM10 and 21% for PM 2.5 (but only 19 cities had data on PM 2.5). Therefore, this can be said to be a common phenomenon that appears in the Seoul metropolitan area.

Suwon has no large-scale industrial complexes nor power generation facilities other than district heating facilities using fossil fuels. Therefore, the use of fossil fuels for automobiles and heating, small-scale commercial and business sites, and scattered dust from construction sites are the main sources of the city's air pollutants. Accordingly, Suwon's policy is focused on traffic management and energy demand management and reducing the negative effects of particulate matter on human health. In particular, since major policies to reduce air pollution, such as shifts in industrial structures and regulations on air pollutant emissions, are carried out nationwide at the central government level rather than at the local government level, local governments such as Suwon are encouraging voluntary participation of citizens, providing support to reduce the damage of vulnerable groups, and offering citizens with the right information. Under the circumstance, Suwon has formed the Task Force for Special Measures for Particulate Matter which is participated by 11 divisions of local administration to protect citizens' health from urban air pollution. Major policies are as follows.

Suwon City makes it mandatory for public agencies to implement the Alternate-Day-No-Driving System when a fine dust warning is issued while encouraging citizens' voluntary participation. In addition, the city opened an online homepage and a mobile application where residents can acquire information about the concentration levels of air pollutants in their residing areas and check guidelines on how to behave according to the levels of concentration. Suwon City has allocated the budget for replacing the city's buses with CNG (Clean Natural Gas)-fueled buses, and 83% of buses were replaced in 2016. In addition, as part of efforts to attract more public transit users, the city government created the Transit Transfer Center near the Suwon Station to enable smooth transfer of passengers between buses and subways and also improved bus stop facilities. Furthermore, sprinkler trucks and road sweeping vehicles are running more frequently to remove re-scattered dust coming from roads. The city also introduced regulations such as mandatory installation of dust scattering prevention fences at construction sites to reduce dust coming from construction sites and made it mandatory to clean vehicles that go to or come from the sites with water.

Suwon also measured indoor air quality levels in day care centers, kindergartens, and senior citizen community centers and provided free consultation on air quality management (from 2015 to 2016) to protect the health of vulnerable groups (infants, preschoolers and the elderly). Electricity generation of the country is largely dependent on high thermal power plants that emit high levels of air pollutants (as of 2016, 62% of power was produced by coal, oil, and LNG-powered thermal power plants). So, Suwon has been committed to electricity generation from photovoltaic, solar and geothermal power (installation and operation of the 22.5MW power plant by 2016) and aims to raise its energy self-sufficiency through clean local energy generation.

3) Water quality control of streams in living environments

The four major streams in Suwon are flowing all over the city. Except for only one of them, the remaining three streams flow all around the downtown area or around apartment buildings, and trails, parks, and sidewalks have been formed along the streams. Among the major streams in Suwon, the *Hwangguji* Stream is a local stream that is managed by the State so the water quality of the stream is monitored by the nation and the results are constructed in the national statistics database. The remaining three rivers' water quality is measured monthly by the city, and the results are posted on the website of the Suwon city government. In 2008, the BOD levels of the *Hwangguji* Stream was 17 mg/L or grade-6 water quality (very poor) which means it was not appropriate to be used for daily water or agricultural irrigation. However, in 2016, the level was improved to a 3-grade (normal), ie, if it undergoes a high-level water treatment, it can also be used as a water source. The water quality of other three rivers was also improved to 2-and 3-grade levels. Such achievement is a result of Suwon City's policy efforts: managing the pollutant discharge load; installing the pre-treatment facility to

reduce the non-point pollution source, and restoring and constructing the ecological river, and encouraging citizen networks' activities of improving the conditions of river basins.

2.6.2 What to do

Suwon is a city that does not have industrial complexes or thermal power plants that cause high levels of environmental pollution but is comprised of urbanized areas with densely populated residential complexes. Suwon City has well-designed waste management policy in line with the national policy. The examples include waste collection from designated points, clearing the points of discharge and fly-tipping prevention. Suwon's achievement rate regarding Indicator 11.6.2 has been 100% since the 1990s, and when the total amount of generated urban solid waste is applied as an alternative indicator, Suwon is showing a good performance as the amount hasn't increased over for the past 10 years in spite of the population growth of the city.

Suwon has high population density and many apartment buildings so the urban solid waste usually comes out in large quantities in certain places. Given such characteristics, the city has been focused on hygienical waste treatment and frequent collection of waste (daily collection of food waste and waste to be incinerated and once a week for recyclable waste). However, classifying urban solid waste by type at the time of discharge could be somewhat challenging, especially for foreign residents who are not familiar with the city's waste disposal policy, so there is a need to continuously enhance the publicity of waste collection methods of Suwon and the country. In addition, the government should continue to implement policies such as periodic cleaning to reduce the odors that may occur when food waste is collected in summer, and promote the use of major collection points.

Suwon was included in the Seoul Metropolitan Area for Special Management of Air Quality which is comprised of Seoul and Gyeonggi Province. Under the initiative, the air quality of Suwon has been subject to intensive management since 2005. Such policy on air quality improvement significantly reduced the concentration levels of PM10 in the air and we started to officially measure PM 2.5 in 2015 and strengthened atmospheric environment standards for PM 2.5 in 2018. However, the ozone concentration levels are increasing in connection with the absolute increase in traffic volume and energy consumption caused by urbanization, and Suwon failed to meet national air quality standards for PM 2.5 in 2016. Despite relatively low levels of emissions generated inside the city, the major reason behind the high concentration levels can be found in the accumulation of particulates due to the frequent air congestion caused by the densely located urban buildings in the basin-type terrain and lack of large mountains or deep rivers. While major polices to tackle air pollution should be implemented at the national level as it requires changes in the industrial structure and energy source, reorganization of transportation systems and control of business sites that emit large amount of air pollutants, the Suwon city government has been committed to reducing particulate matter and launched its own Task Force to combat particulate matter while exploring various policies such as transportation demand policy, management of dust scattered from the roadside, creation of urban forests, policies to reduce the negative impact of particulates on the vulnerable, and providing information on particulate matter through the mobile application. Such policy should be continuously promoted as it creates more spaces for wind flow and facilitates smooth air circulation. However, for these policies to take effect, it requires years of commitment and needs to be connected with neighboring cities and metropolitan areas, and the sustainable policies on national and international cooperation will also be critical.

2.7 Review of Target 11.7

Target 11.7	By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities
Indicator 11.7.1	The average share of the built-up area of cities that is open space for public use for all, by sex, age, and persons with disabilities
Indicator 11.7.2	The proportion of person victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months

The Indicators of Target 11.7 are designed to understand the size of public space that can be readily accessed by citizens. In case of Indicator 11.7.1, it provides a means of evaluating the accessibility to public space, especially for children, minors, women, and persons with disabilities. On the other hand, Indicator 11.7.2 provides a means of evaluating how safe people are from various crimes.

As for Target 11.7, no precise indicator can be found in existing research due to the lack of clear definition of public spaces and the broad scope. Instead, it can be replaced by using indicators such as “park area per capita”, “allocated park area per capita”, “urban parks, green spaces, and recreation areas”, “per capita urban forest”, and “crime rate.”

2.7.1 How it works in Suwon

1) The current status of Suwon related to Indicator 11.7.1

The priority of Suwon's urban policy has been creating a sustainable eco-city. With regard to Target 11.7, the city has been making constant efforts to allow every citizen access public spaces while enhancing the public use and quality of the spaces.

[Size of public space in Suwon] The total size of sites for public facilities has more than doubled from 2,832,681 m² in 2011 to 6,397,834 m² in 2016. Such increase is the result of Suwon's continuous efforts to create parks, athletic fields and other types of public spaces accessible to citizens.

[The allocated size of land for the creation of parks in Suwon] According to the Basic Plan on Urban Planning of Suwon, the land of 16,321,532.5 m² or 13.5% of Suwon's total area, was allocated for the creation of parks. Although the allocated size is bigger than the national standard suggested by the Ministry of Land, Infrastructure, and Transport, the size is still below the national average of 21.0 m².

[Actual size of land for parks in Suwon] Suwon has been steadily creating more children's parks, small parks and neighborhood parks for citizens. In spite of such efforts, The park area per capita in Suwon is below the nation's average of 8.6 m² as of 2014 according to Statistics Korea (www.index.go.kr) and this is because that the natural green areas of Mountain Gyanggyo and Jijidae Park (not included due to the development restriction zone inside the park) were not considered as park areas, and that the population growth in Suwon has been relatively high compared to other cities while its high population density also affected the result. The ratio of the actual size of land for parks compared to that of urban areas is 7.02%, which is three times higher than the national average of 2.48%, indicating that a significant percentage of urban areas in Suwon is made up of parks.

[Size of green belts (or green areas) in Suwon] Greenbelts (or green areas) are regarded as basic infrastructure of cities and are designated spaces to improve the landscape of cities by preventing air pollution and disasters. Green belts are divided into three types: Buffer greenbelts: Greenbelts created

to prevent air pollution, noise, vibration, foul odors, and other pollution equivalent thereto, various accidents, natural disasters, and other disasters corresponding thereto, etc.; Scenic greenbelts: Greenbelts created to preserve and improve the natural environment of cities and to upgrade the urban scenery by improving and restoring damaged natural areas; Connecting greenbelts: Linear greenbelts created to organically connect any park, river, mountain area, etc. in urban areas and furnish urban citizens with space in which they can relax, entertain, walk, etc. The size of green belts in Suwon is 1,701,843 m² as of 2016, and that of connecting greenbelts is 46,182 m². The per capita green belt is about 1.5m².

[Universal Design Guidelines of Suwon and its application to public buildings] The application of Universal Design Guidelines is important from a policy point of view as it promotes mobility of everyone regardless of age, sex, and physical disability. Started by the fifth elected mayor in 2013, Suwon has been working together with public agencies, providing consultation for the application of "Universal Design Guidelines of Gyeonggi Province" and checking the status of the application to basic design plans of public buildings. As part of such efforts, Barrier Free Certification System was adopted to all public buildings in 2017. Currently, Suwon is working on changing signs and in the implementation phase of the application of the Signs of Universal Design to public buildings in consideration of visitors. As of 2018, Suwon is developing its own Universal Design Guidelines of Suwon.

[Car-free Street Project in Suwon] Suwon selected test-bed areas for 'Car-free Day' to create a pedestrian-oriented street culture. With the aim of reducing the number of cars on the road and spreading eco-friendly transportation means such as walking and bicycles, the project allowed citizens to select the test-bed areas by themselves. Such project has been made possible thanks to the public consensus has been created on the necessity and the positive effects of car-free streets and not-motorized transportation mean ever since Suwon's EcoMobility World Festival 2013.

In this Car-free Day Project, citizens suggest various programs and cultural events on car-free streets and street performances, traditional plays and flea markets have been held by citizens. The Car-free Day Project has been implemented in 11 areas by 2017 and will expand to 13 areas by 2018.

[Dream Playground Project of Suwon] With the 6th elected mayor's promise of carrying out the Dream Playground Project, the city is building creative theme parks, which will help children develop imagination and sensitivity, and is suggesting a new model of park creation that involves citizens and children in every phase from planning to construction, going beyond the existing framework of the children's playgrounds. A total of 20 Dream Playgrounds will be created on 103,238.3 m² of land. In the meantime, designs suggested by children will be reflected as much as possible. To that end, the city government actually made teaching materials to educate children on how to design spaces and Suwon's such efforts were recognized by receiving the Top Prize at the Public Design Award of the Republic of Korea.

2) Safety of public space with regard to Indicator 11.7.2

[Crime rate at public space] Information on crime spots is not disclosed by municipalities. In case of the number of criminal cases, Suwon had 3,289.1 cases in 2011 and 3,330.4 cases in 2012 and showed lower crime rate compared to the national average, which indicates that Suwon is a relatively safe city. However, Suwon's crime rate was higher than the national average in 2016, which is attributable to a large number of crimes related to the Special Act on Elections were revealed during the general election period in 2016.

Table 11. Comparison of Crime rate in Suwon and in nation-wide

Unit: case (Number of crime cases÷population)×100,000

Category	2011	2012	2013	2014	2015	2016	Ref.
Crime rate in Suwon	3,289.1	3,330.4	3,341.2	3,376.9	3,736.2	4,118.9	
Nation-wide crime rate	3,750.4	3,796.8	3,903.7	3,767.6	3,921.5	3,884.8	

[Sexual crime rate at public space] The ratio of the number of crime cases at public spaces to the total population of Suwon was higher than that of the national average(44.1) in 2011, however, the ratio has been below the national average ever since 2013, and the ratio of Suwon and that of the national average was different by more than 10 in 2016. Such visible difference is attributable to the city's continuous efforts for the safer public spaces.

[10 Principles for Safe Alleys in Suwon] Suwon enacted the "Ordinance on Environmental Design for the Prevention of Crime in Suwon" and set up guidelines on basic principles of design through analysis of risk factors of alleys, the poor environment, etc. The city government published booklets with easy-to-understand design guidelines such as "make it look good," "provide information," and "clean the streets," and these guidelines received the Grand Prize in the category of the Public Design Academic Achievements at the Public Design Award of the Republic of Korea

[Safe Village Projects in Suwon] Suwon strengthened its effort to create safer public spaces by applying Crime Prevention through Environmental Design (CPTED) to villages' public spaces that are vulnerable to crime. The projects that the city has conducted for the safety of villages' public spaces include "Happy and Safe Village of *Songjuk* (Ministry of the Interior and Safety)," "Safe Village Project around *Pajang* Elementary School (Ministry of Land, Infrastructure and Transport)," "*Jidong DDabok* Safe Village (Ministry of Justice, Gyeonggi Province)," and "Safe Village of Doran in *Maegyo-dong* (Ministry of Justice)."

2.7.2 What to do

With regard to Target 11.7 of Goal 11, the allocated park area per capita and the actual size of land for park per capita in Suwon are 13.50 m² and 6.90 m² respectively. Though the number is relatively lower than the other cities and region, since EcoMobility 2013, Suwon has introduced "Car-free Day" and Universal Design Guidelines to promote eco-friendly means of transportation and provide citizens with access to public space regardless of sex, age, and physical disability. In addition, the city has been building Children's parks by listening to children's ideas about the parks' design.

Suwon is turned out to be a relatively safe city. Suwon is also making and distributing easy and efficient design guidelines such as 10 Principles for Safe Alleys in Suwon and, with its Safe Village Projects, the city is committed to making public spaces safer for citizens.

As such, Suwon City is exploring various policies that can be implemented at the city government level. Although the city is relatively small, Suwon is committed to providing universal access to public spaces and achieving Sustainable Development Goals (SDGs).

3 Conclusion

Diagnosis of Suwon city in the light of global indicators

The reason for diagnosing cities based on goals and indicators adopted by the international community can be found in the close relationship between cities' sustainability and the global sustainability. UN SDGs Goal 11 specified the targets and indicators for "Sustainable Cities and Human Settlements" is one of the main agendas to be reviewed at the United Nations High-level Political Forum (HLPF) on Sustainable Development in 2018.

Especially, the Global Taskforce of Local and Regional Governments (GTF), which was launched by the global network of local governments in the process of adopting the UN SDGs, committed itself to the adoption of the city-related goal and underscored the important role that local governments should play in promoting sustainable cities. Given the fact that Goal 11 is the result of such efforts, local governments should fully acknowledge their important mission of leading the success of "Goal 11," and the duty of diagnosing the sustainability of cities in the light of global indicators should be fulfilled at the state and local levels.

Suwon Implementation Report on Goal 11, the first-ever city's report in Korea

This report was formulated by organizations that play a major role in promoting sustainable development of Suwon. Researchers of Suwon Research Institute (SRI) analyzed the current status and tasks of Suwon based on the indicators of Goal 11. Suwon Council for Sustainable Development (Suwon CSD) which adopted the 10 Sustainable Development Goals of Suwon (10 SDGs of Suwon) in 2017, worked as a supervisor and an advisor to link 10 SDGs of Suwon to the analysis results based on the global indicators and to come up with follow-up measures. With this first report on SDG 11 in Korea, ICLEI Korea Office helped Suwon City connect local government policies with international efforts and to share the identified tasks for the UN SDGs with the international community. Such efforts have laid the solid foundation for participation and cooperation of a wider range of stakeholders and for mainstreaming of "sustainability" policy in Suwon.

Crucial time for visioning policy goals and directions with specified time-frame by 2030

This report shows that Suwon City has been promoting tasks and policies in pursuit of all targets of Goal 11 with its commitment to the values upheld by SDGs. In particular, Suwon City has been implementing a variety of policies regarding targets of SDGs and has been leading the efforts to realize SDGs by adopting policies that are not common in Korea.

However, it is hard to find detailed objectives of Suwon's policies in terms of target years. Given the fact that the United Nations SDGs propose 2030 as the target year, this "Suwon Implementation Report on Goal 11" will be used as a tool to re-tune the strategies and approaches of the city's policies with the aim of shaping the vision of a sustainable city of Suwon by the target year of 2030.

Datasets: challenges for analysis based on SDGs indicators

The universally adopted United Nations Sustainable Development Goal 11 is comprised of 10 specific targets and 15 indicators. This report looked into 7 targets (excluding 3 targets on implementation measures) and 11 indicators and used them to analyze the current status of Suwon.

For the purpose of analysis, the city underwent the process of "setting targets and indicators in the local context of Suwon", and devoted itself to finding the most appropriate indicators for each target. By doing so, the city analyzed its current status and suggested tasks for the future. Despite the fact that 7 out of 11 indicators are Tier 1 indicators, which means they have a well-established methodology and available statistical data, it was still difficult for Suwon to select data for the analysis. Even for indicators that were easy to find relevant statistical data, they were still not enough to be used as practical indicators to evaluate the city in the light of SDG 11 targets.

Even though we reviewed various statistics and related data to overcome limitations of the proposed indicators, finding appropriate data was still accompanied by a number of challenges, and it was only a process to reaffirm the reality that the society's statistical basis is still very weak. It suggests the need for improving the national statistical system and for strengthening the statistical infrastructure at the municipal level of Suwon.

Beyond indicators: exploring synergy by linking global goals and local context

International agreements that were recently adopted by the international community emphasize the necessity of 'sustainable cities' and call on local governments to play a leading role in promoting sustainable cities. The city hopes that this report would be humble beginnings in response to these international requests.

Now Suwon needs more concrete research and policy decisions on how "its future tasks and process of achieving a sustainable city of Suwon" should look like. To begin with, the city needs to remind itself the basic premise: "City is for everyone" and reach an agreement on priority tasks that can drive real changes in the light of its vision, and the process should reflect the needs and demands of various stakeholders while everyone shares roles/responsibilities in an efficient way. In that way, Suwon will be able to grasp the whole picture of a sustainable city of Suwon, and such efforts would create much more policy synergies when they are backed by inter-municipal/inter-local cooperation.

Hopefully, Suwon's such efforts would encourage the participation of many other cities seeking sustainability.

Park Yeonhee

Director of Global Future Research Center of SRI
Director of ICLEI Korea Office