

Sustainable Development Goals

Policy Brief Series No. 12

Using Urban Green Spaces in the Pandemic: Example from the Republic of Korea

LEAD AUTHORS

- Ms. Jiwon Kim, Researcher, Korea University;
- Ms. Whijin Kim, Researcher, Korea University;
- Mr. Youngjin Ko, Researcher, Korea University;
- Ms. Gaeun Kim, Researcher, Korea University;
- Ms. Jeongmin Lee, Researcher, Korea University;
- Ms. Olebogeng Thelma G. Eyman, Researcher, Korea University;
- Dr. Sarwat Chowdhury, Policy Specialist, UNDP Seoul Policy Centre (USPC);
- Ms. Julie Adiwai, Consultant, USPC;
- Mr. Hyungkyu Won, Intern, USPC;
- Dr. Yowhan Son, Professor, Korea University;
- Dr. Woo-Kyun Lee, Professor, Korea University;

PEER REVIEWER

- Ms. Anne Juepner, Director, USPC;

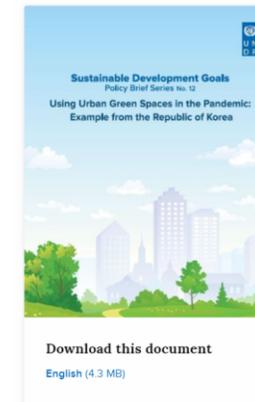
EDITING TEAM

- Mr. Daein Kang, Intern, USPC;
- Mr. Axel Ronaldo Lemus Rodas, Intern, USPC;

Presenter
Woo-Kyun LEE
Korea University



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Using Urban Green Spaces in the Pandemic: Examples from the RoK

Jan 27, 2022

Urban green spaces (UGS) improve health and environmental outcomes for urban residents by providing green areas for recreation and relaxation while supporting pollution control, biodiversity conservation, carbon sequestration and reducing heat retention. This paper analyses UGS as part of the response to COVID-19. It examines citizen perceptions about UGS and how those perceptions have changed during the Pandemic. The paper also examines policies and programmes employed by the Republic of Korea to expand UGS and increase its utility. The paper suggests that UGS can be a cost-effective and nature-friendly response to crises and that the ROK's experiences may have implications and lessons for other countries.

https://www1.undp.org/content/seoul_policy_center/en/home/library/using-urban-green-spaces-in-the-pandemic-examples-from-the-rok.html

Mega-trend

- We are facing now aging, urbanization, climate crisis, and also pandemic crisis etc. so called Megatrend
- Mega Trend refers to ‘a general tendency or direction of a development or change over time.’ and is an important direction that will shape personal, social, and global lives for 10 years or more.
- The modern society is changing at a much faster rate than before, and the degree and scope of uncertainty are also increasing.
- By identifying and responding to the Mega Trend, global society needs to alter future problem to chace.

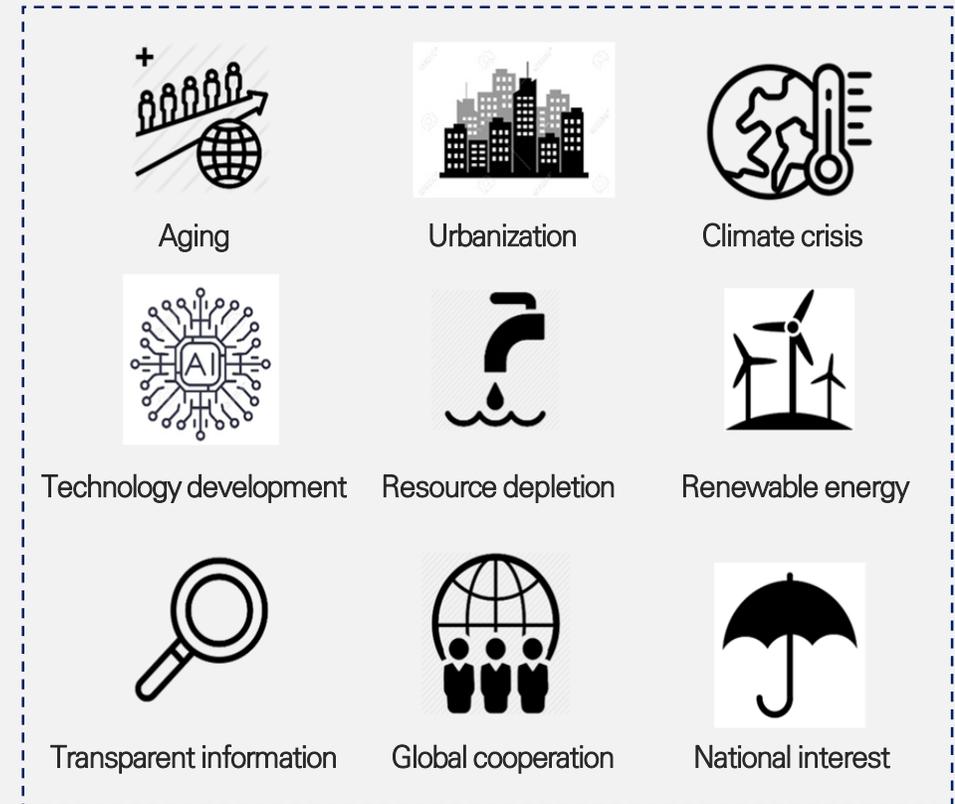


Figure 1. The World in 2030: Nine Mega Trends to Watch
(Resource: <https://sloanreview.mit.edu/article/the-world-in-2030-nine-megatrends-to-watch/>)

Climate crisis and COVID-19

- Although 100% of each country's NDC is achieved, the global average temperature rise is expected to exceed 2 degrees.
- The Global Risk Limits, published by the Stockholm Resilience Center, warn that the **Biodiversity loss, Human interference with the nitrogen cycle, and Climate change** are outside “Planetary boundaries”, meaning “Not Resilient”, “Hardly be Recoverd”
- Climate crisis and COVID-19 pandemic has many similarities in terms of.
 - Global problem
 - Unclear cause
 - Unspecified number of victims
 - Risks and crises beyond change
 - Searching for pluralistic solutions in all fields of the global/national/local government and society

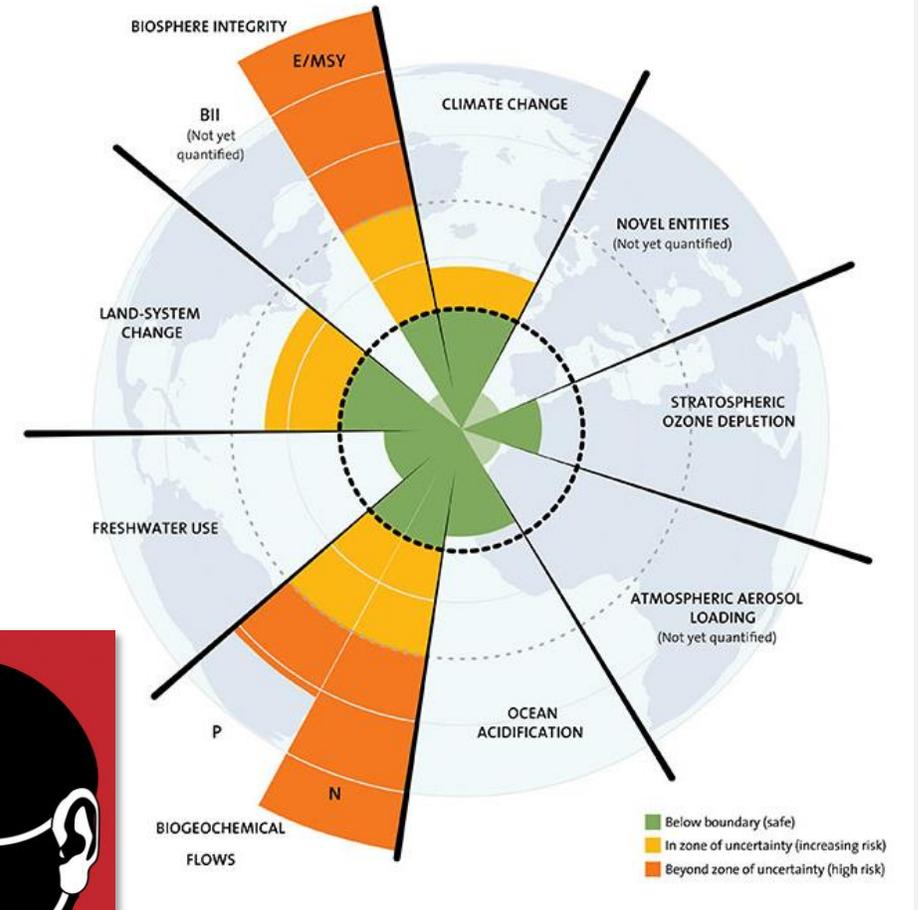


Figure 2. Planetary boundaries (Resource: Rockstrom, J. et al., 2009)

A novel pandemic threatening society: COVID-19

- Coronavirus disease 2019 (COVID-19) is an **ongoing epidemic** caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 is spread by **human-to-human contact**, and **via aerosols** produced from coughing and sneezing entering respiratory organs (Lotfi et al., 2020).
- COVID-19 impacts economic and environment as well as public health.

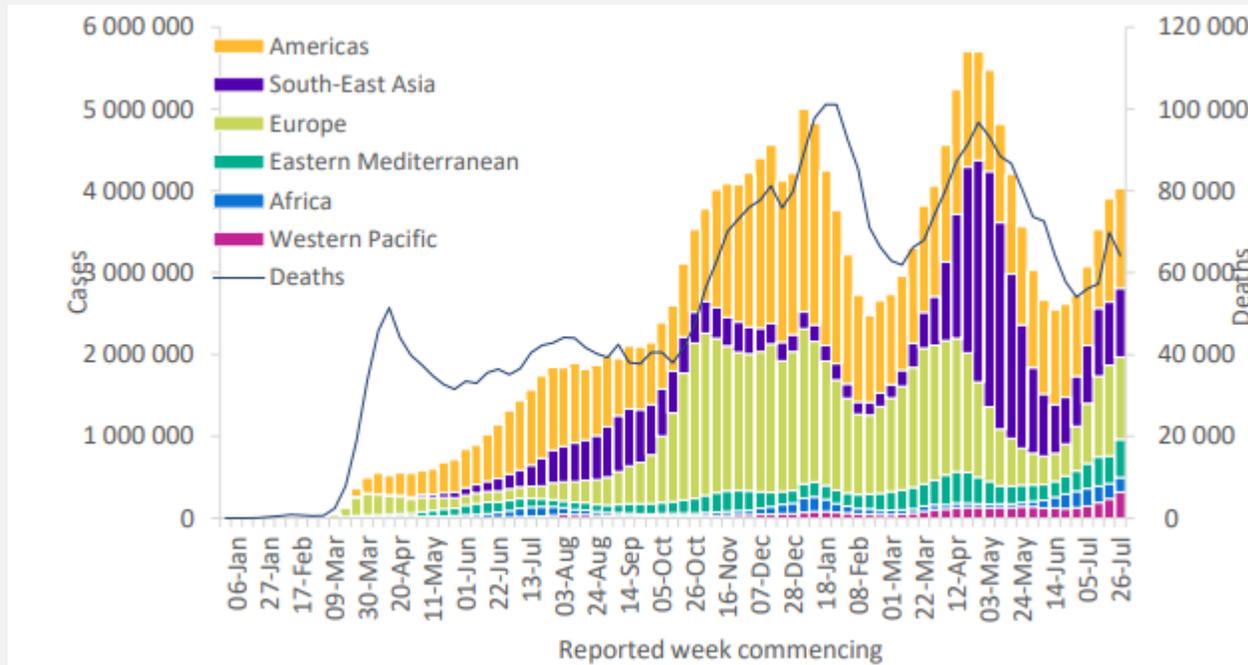


Figure 3. The status of COVID-19 from January to July in 2020

Table 1. COVID-19 impacts on society and environment

Aspect		Description
Public health	Physical	Decrease of common respiratory diseases and the incidence of infectious diseases other than COVID-19
	Mental	Deterioration of mental health issues
Economic		Economic recession due to the changes and shrinkage in supply and demand Deepened global unemployment challenges
Environment		Water and soil pollutions due to the continuous production and disposal of sanitary consumables products and one-way material consumption

What is urban green space?

- As the Sustainable Development Goal 11 (SDG 11) “Sustainable cities and communities” suggests **creating public green spaces** is one way to make cities sustainable (UNDP, 2021), the proper creation of urban green spaces has been given importance in terms of urban planning (Feltynowski & Kronenberg, 2020).
- Due to the ambiguity of boundaries, there is no generally accepted definition of urban green space currently. In our report, we mainly focused on human interaction with urban green spaces in the pandemic era. Therefore, we defined the **urban green space** as any kind of urban green infrastructure, including networks of all natural, semi-natural and artificial ecosystems, within, around, and between urban areas. The types and benefits of urban green space are classified in Table 1 and 2.

Table 2. The categories and elements of urban green space in this report

Category	Green space element
Parks	small parks, children's park, historical parks, waterside parks, cemetery parks, sports parks, urban agricultural parks, etc.
Gardens	backyard or botanical garden, etc.
Roadside greenery	street trees, shrubs, herbaceous plant, etc.
Landscape around buildings	trees, shrubs, green walls, green roofs, etc.
Waterside green spaces	coastal, riverside, lakeside green spaces

Table 3. The benefits from urban green space

Category	Benefits
Environmental	Provide habitat for urban wildlife
	Provide linkage of the urban and rural areas
	Reduce urban heat island
	Sequester carbon
Social and psychological	Provide space to exercise and relax, spend time with nature
	Improve social interaction and community cohesiveness
	Improve levels of mental health and physical fitness



Figure 4. Examples of various types of urban green space; (a) green wall, (b) street green and green verge, (c) riverbank green, (d) large urban park, (e) Allotment, (f) arable land, (g) forest, (h) lake, pond.

(* Source: <http://www.oneyes.tv/news/articleView.html?idxno=92614>)

Why do we need nature based solution here?

- The need of adaptation strategies for COVID-19 pandemic:
 - No specific or precise estimate of the end of COVID19
 - To reduce disease risks sustainably and in a way that creates synergies for biodiversity and health.
- NBS for green recovery
 - NBS can bring the recovery from COVID-19 and building our system back better and greener by accounting for environmental and climactic drivers in order to support human society and build resilience (Rizvi et al., 2015).
- Urban green space in Pandemic era
 - Even though the daily mobility fluctuates according to different circumstances by countries, the overall trends showed an **increasing tendency to visit parks** during Pandemic era.
 - The importance of the urban green space has grown since COVID-19 made drastic changes in people’s lifestyles due to the tendency to **avoid close-contact spaces to follow the social distancing and quarantine guidelines**

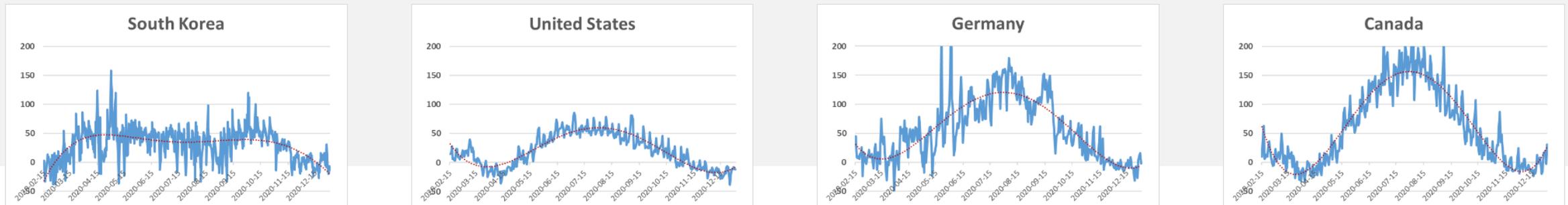


Figure 5. The number of visitors during 2020

Why do we need nature based solution here?

- High demand for healthy life environment after COVID-19 pandemic:
 - According to the '2025 Future Housing Trend Report' conducted by Korea Housing Institute, Koreans considered 'comfort' first place with 38% when they select future housing.
 - Also as in '2020 Quality of Life Report' released by the National Statistical Office, **satisfaction with the natural environment** such as mountains and parks in the residential area was about 58.7%.
 - The demand for urban green space is high as the pandemic rages on.
- The reasons why urban green space has become more important:
 - (1) Urban green space acts as a 'spatial vaccine' both physically and psychologically.
 - (2) Urban green space has gained acceptance as a sustainable solution for the fundamental problems of the city.

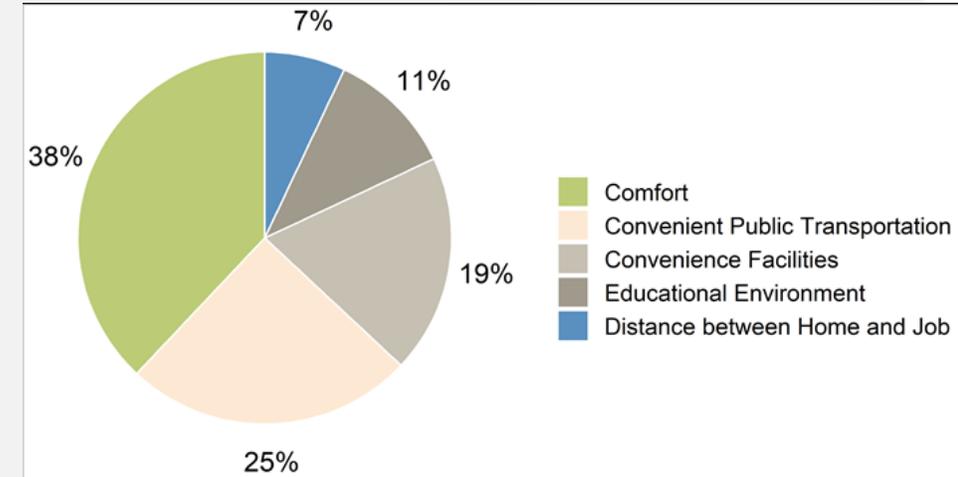


Figure 6. The factors in considering future housing (Source: Korea Housing Institute, 2016)



Figure 7. People waiting for their COVID-19 investigation in UGS

Survey: Citizens' awareness of urban green space and pandemic

- A survey was conducted to know perception of citizens about urban green spaces with benefits in terms of NBS. Korea University and UNDP have launched a survey with the objective to understand how the COVID-19 has changed citizens' perspectives and attitude toward green spaces and urban forests. The survey focuses on how the public perception and using pattern of urban green spaces have changed due to the outbreak of COVID-19 in South Korea.
- The online survey was conducted from 12th April to 28th April 2021.

Table 4. Survey structure

Items	Contents
Personal characteristics	Consisting questionnaire including occupations and form of works or classes
Awareness of UGS	Consisting questionnaire including range, benefits, and importance of UGS
Changes of pattern in UGS usage	Consisting questionnaire including number of visits and using patterns pre- and post COVID-19
Demand for UGS for reducing COVID-19 effects	Consisting questionnaire including appropriate transportation, required time, and necessary facilities and service to enlarge use of UGS

Survey structure

Personal details

1. What is your gender? *

Male Female Other

2. What is your age group? *

10s 20s 30s 40s
 50s 60s or above

3. What is your occupation? *

Office/administrative work Manufacturing/technical sector
 Sales/service sector Homemaker
 Student Other:

4. Form of work or classes *

Home-based and/or online In-person and/or offline
 Hybrid Other:

Gauging awareness of UGS

Indoor gardens (indoor landscapes in department stores, Seoul Botanic Park, etc.)
 Rooftop gardens (Seoul Metropolitan Library, etc.)
 Green spaces in private residences or apartment complexes
 Green spaces in schools, public institutions, etc.
 Mountain hiking/trekking courses (Namsan Park, Bukhansan National Park walking trails, etc.)
 Boulevards and roadside green buffer zones
 Parks nearby commute routes Green spaces near urban streams
 Urban forests Reservoirs Amusement parks
 National Parks Other:

6. How do we benefit from UGS? *

Purification of urban environment including countering air pollution, noise pollution, etc.
 Beautification of urban scenery
 Absorption of sun's heat and mitigation of heat island effect, climate regulation, etc.
 Emotional stability, emotion regulation, etc.
 Protection of settlements* from floods, snowstorms, earthquakes, etc.
 Educational, art/cultural aspects
 Other:

(* Settlements are defined here as developed land inclusive of human domiciles, transport facilities, and other usage that do not fall under other types of land usage)

7. How important do you think UGS were before Covid-19? *

Very important Important Average
 Unimportant Very unimportant

8. How important do you think UGS are after Covid-19? *

Very important Important Average

9. How often did you use UGS before Covid-19? *

Daily Almost daily 1-2 times per week
 1-2 times per month Rarely Never

10. How often do you use UGS in the wake of Covid-19? *

Daily Almost daily 1-2 times per week
 1-2 times per month Rarely Never

11. Has there been a change in the frequency of your visits to UGS in the wake of Covid-19? *

I did not visit them before but I have started visiting them. (Go to "if your usage of UGS has increased")
 I visit them more than before. (Go to "if your usage of UGS has increased")
 No change. (Go to "if your usage of UGS has decreased")
 I visit them less than before. (Go to "if your usage of UGS has decreased")
 I do not visit them at all. (Go to "if your usage of UGS has decreased")

If your usage of UGS has increased

12. What was/were your reason(s) for using UGS before Covid-19? (You may choose a maximum of 3 responses) *

Exercise Relaxation or meditation Connecting with nature
 Spending time with family or friends Moving to another location
 Walking pet animals Other:

13. What is/are your reason(s) for using UGS in the wake of Covid-19? (You may choose a maximum of 3 responses) *

Exercise Relaxation or meditation
 Connecting with nature Spending time with family or friends
 Moving to another location Walking pet animals Other:

14. If your usage of UGS has grown more frequent in the wake of Covid-19, what is/are your reason(s)? *

They are a replacement for gyms and other exercise facilities
 They enhance our immune system
 Increase in leisure time
 They are a replacement for cafes and other restricted public places
 They help to cope with depression, etc. and aid in psychological health and recovery
 They prevent disease transmission by virtue of their spaciousness
 Other:

If your usage of UGS has decreased

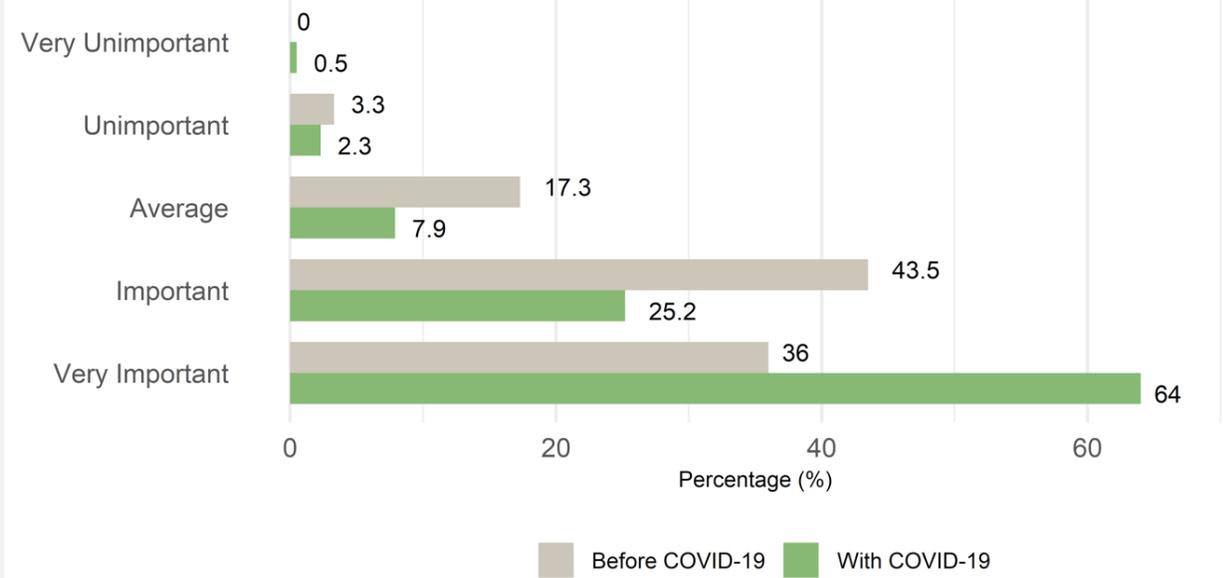
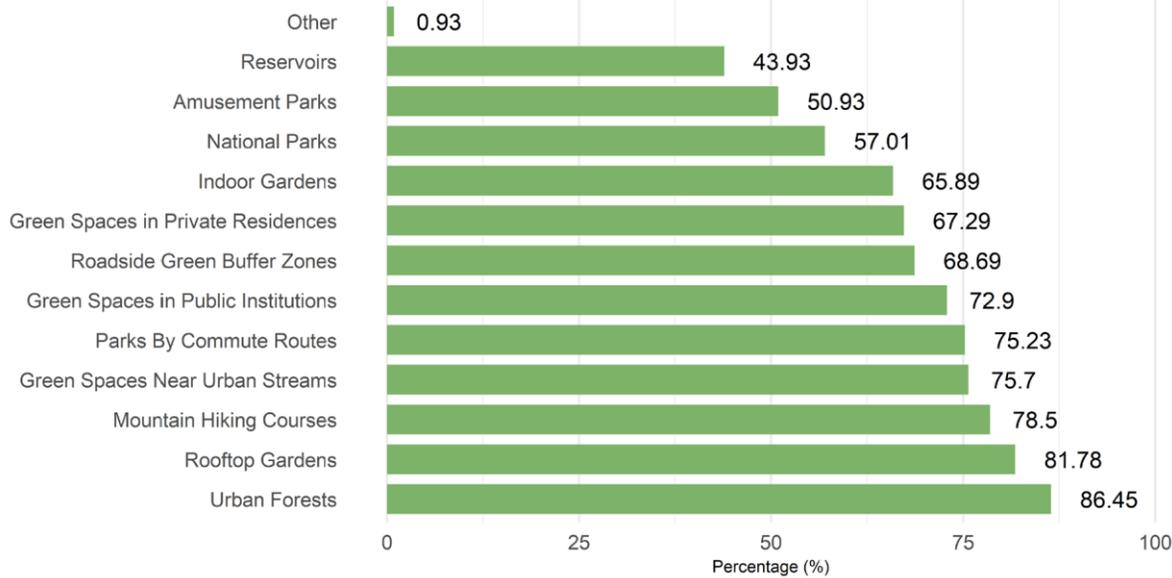
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 Walking pet animals Other:

13. What is/are your reason(s) for using UGS in the wake of Covid-19? (You may choose a maximum of 3 responses) *

Figure 8. Survey inquiries

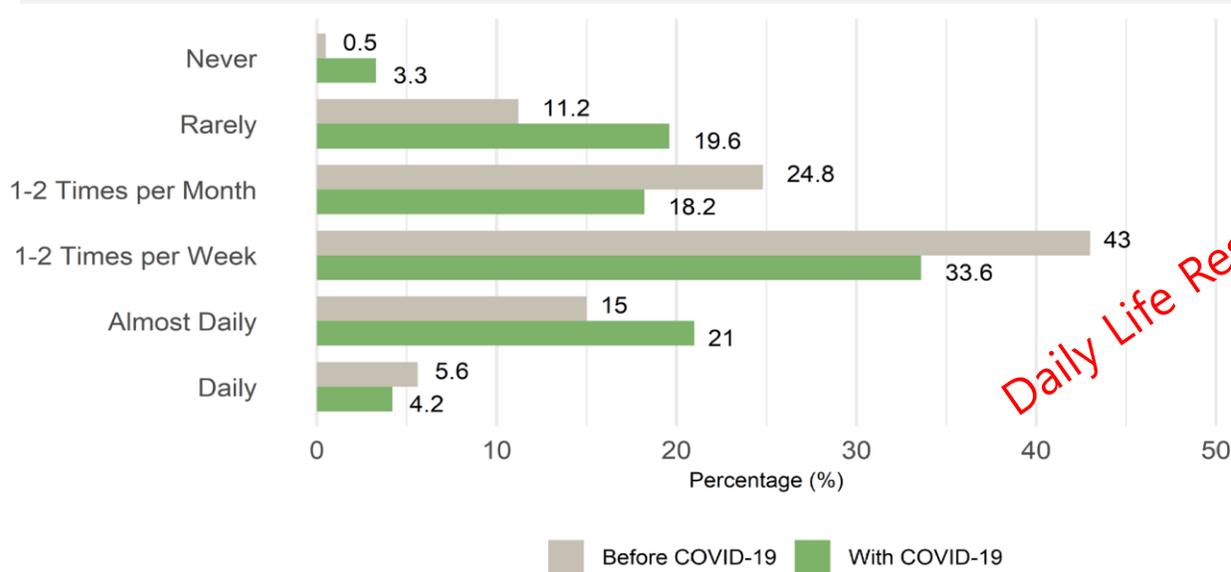
Survey: Citizens' awareness of urban green space and pandemic



- The range of respondents' perception to urban green space
 - More than half of respondents recognize various kinds of space **with vegetation** as urban green space except reservoirs.
 - People perceive not only large areas as UGS such as urban forests, but also **indoor green area** such as rooftop gardens.

- The importance of UGS before and with COVID-19
 - **About 79.5%** of the total respondents answered that they consider UGS is quite important before COVID-19.
 - But after the outbreak of COVID-19, the rate of respondents who recognize the importance of urban green spaces rose to **90%**.
 - “Very important” increased to 64%, moving ‘important’ to ‘very important’

Survey: Citizens' awareness of urban green space and pandemic



		After					
		Daily	Almost daily	1-2 times per week	1-2 times per month	Rarely	Never
Before	Daily	6	5	-	1	-	-
	Almost daily	1	21	-	6	4	
	1-2 times per week	1	16	16	48	10	1
	1-2 times per month	1	2	17	14	17	2
	Rarely	-	1	5	4	11	3
	Never	-	-	-	-	-	1

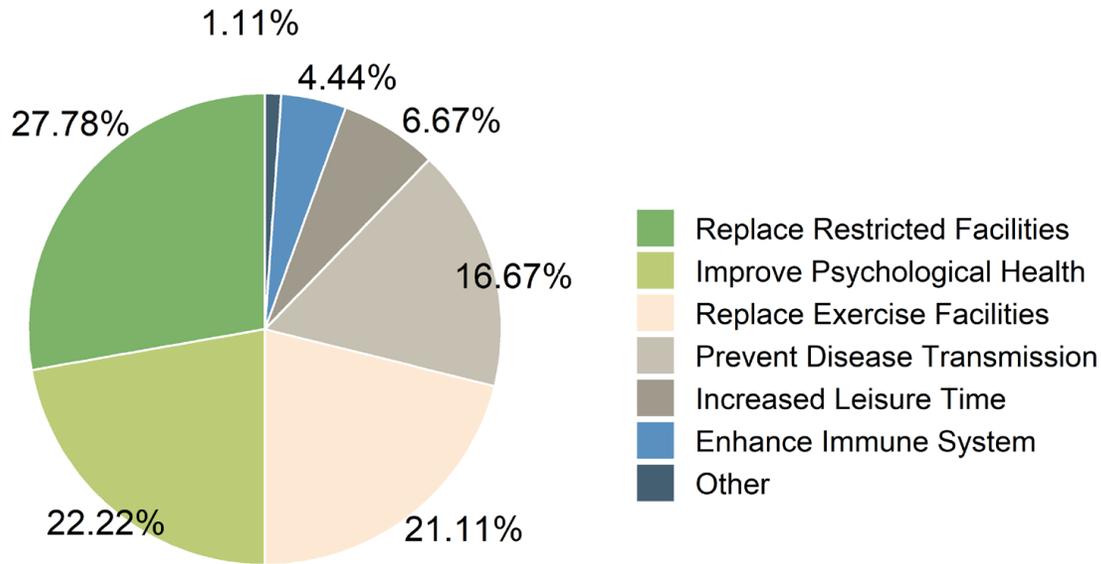
• The frequency of utilization of UGS

- There was no significant change of using trend between before and in the wake of COVID-19.
- But the portion of respondents who newly use urban green space almost daily get larger than those who use it 1-2 times per month.

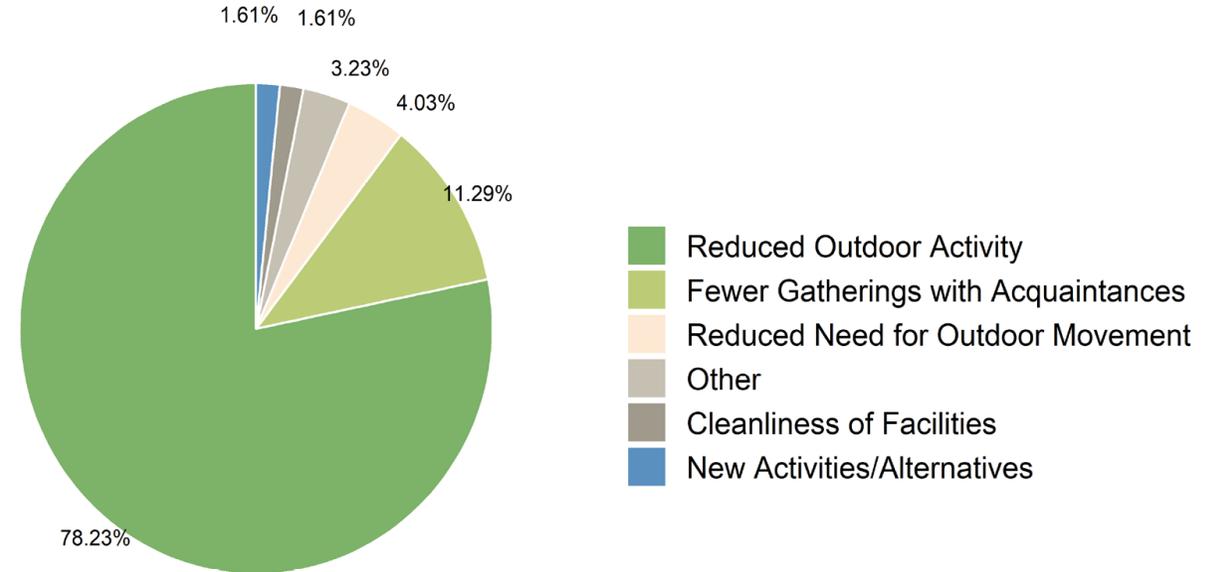
• Change of frequency in UGS utilization

- It seems that more than half of people who had visited urban green space weekly have reduced their visits after the outbreak of COVID-19.
- However the number of people who had used urban green space daily was not changed much.

Survey: Citizens' awareness of urban green space and pandemic

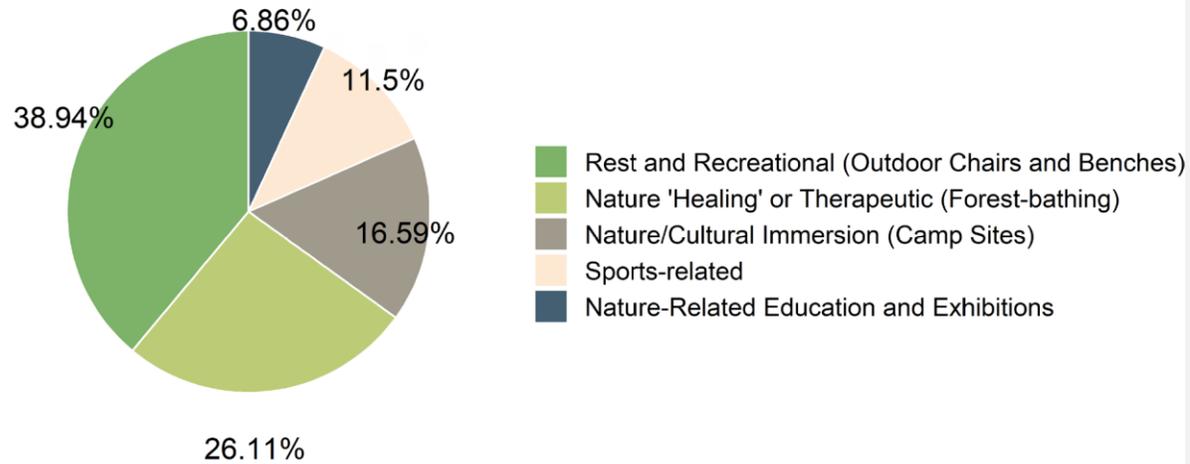


- Reasons for increasing the use of UGS in the wake of COVID-19
 - Respondents who increased the frequency of use, had increased their visits due to replacing other restricted facilities or gym, improving psychological health.



- Reasons for reducing the use of UGS in the wake of COVID-19
 - The most reason that respondents who reduced their visit to UGS after the outbreak of COVID-19 was to reduce their overall outdoor activities.

Survey: Citizens' awareness of urban green space and pandemic



• Facilities to encourage usage of UGS

– Respondents said **facilities for rest and recreation** such as outdoor chairs and benches are needed to encourage the usage of UGS.



• Services to encourage usage of UGS

– The most favorable service was **the comfortable space for relaxation**, followed by tackling environmental issues, and health service.

Suggestions for expanding the use of urban green space

- Diversify the types of urban green space
 - According to the '2025 Future Housing Trend Report' conducted by Korea Housing
- Set a health policy using urban green space
 - (1) Urban green space acts as a 'spatial vaccine' both physically and psychologically.
 - (2) Urban green space has gained acceptance as a sustainable solution for the fundamental problems of the city.
- Provide cultural services with better accessibility

Korean attempts to use urban green space in COVID-19

- **Case 1: Boramae Park in Seoul**
 - Gather citizens' idea to promote the use of park especially during COVID-19
 - Provide park tour program including volunteer activities
- **Case 2: Seoul Forest Park**
 - Hold various events to encourage citizens use the park during COVID-19 including social distanced volunteer activities
 - Encourage people to counter corona blue by participating physical activities
- **Case 3: National Park (Korea Natural Park Service; KNPS)**
 - Create programs for people to relax in national parks during COVID-19
 - Provide walking tour while keeping COVID-19 guidelines
- **Case 4: Indoor gardens**
 - Foster various public indoor gardens to improve indoor air conditions and to provide some green resting spaces for users (Cheonju airport, Seoul botanic gardens, etc.)



Figure 8. Photo from 'Boramae Park Sseudam Sseudam'
Source: Kim, 2020

Government plans to use urban green space for post COVID-19

- **Case 1: The Central Government**

- Design and implicate the 2nd Urban green master plan (2018~2027)

- **Case 2: Gyeonggi-do Principal Government**

- Enact and execute a regulation, ‘Construction and Management of Urban Forests and Other Green Spaces in Gyeonggi-do’, which is a legal basis for sustainable management of urban forests
- Implement expanding UGS as part of ‘Green New Deal model for Gyeonggi-do’

- **Case 3: Gangwon-do Principal Government**

- Design a long-term master plan for UGS, including guidelines for the next hundred years in order to sustainably manage green infrastructure in Urban areas

- **Case 4: Seoul Municipal Government**

- Build windways in cooperation with KFS with a budget of \$15 million by connecting the suburbs to Gwanak Mountain and Bukhan Mountain

2nd Urban Green Master Plan (2018~2027)

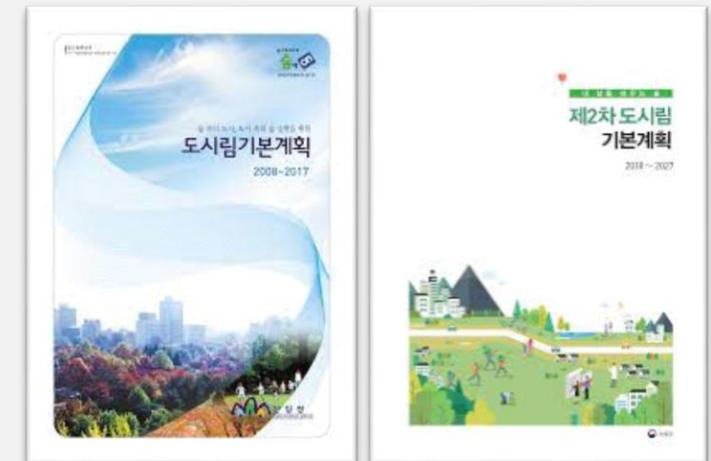
Establish an urban green network system

Enlarge UGS

Improve the quality of UGS

Promote the frequencies of UGS

Establish the foundation for sustainable UGS



Conclusion

- Urban green spaces improve health and environmental outcomes for urban residents by providing green areas for recreation and relaxation while supporting pollution control, biodiversity conservation, carbon sequestration and reducing heat retention.
- To adjust to pandemics like the COVID-19, the usage of UGS can be a valuable tool for adaptation efforts. In the report we found a high potential to use UGS to cope with other pandemics or climate crises.
- Korea has widely and actively used UGS during COVID-19. The government opened various nature spaces to combat COVID-19 and COVID fatigue and collected ideas to use UGS sustainably for the dual purpose of serving society while conserving the environment.
- However, the our results for Korea has limitation, and the conducted survey requires methodological and statistical supplements for a more general conclusion.
- With further research and analysis, this paper can be used as a reference to utilize green infrastructure and spaces as a preferable means to urban planning and design to improve resilience to future pandemics and climate change impacts.



Thank you

Korea University

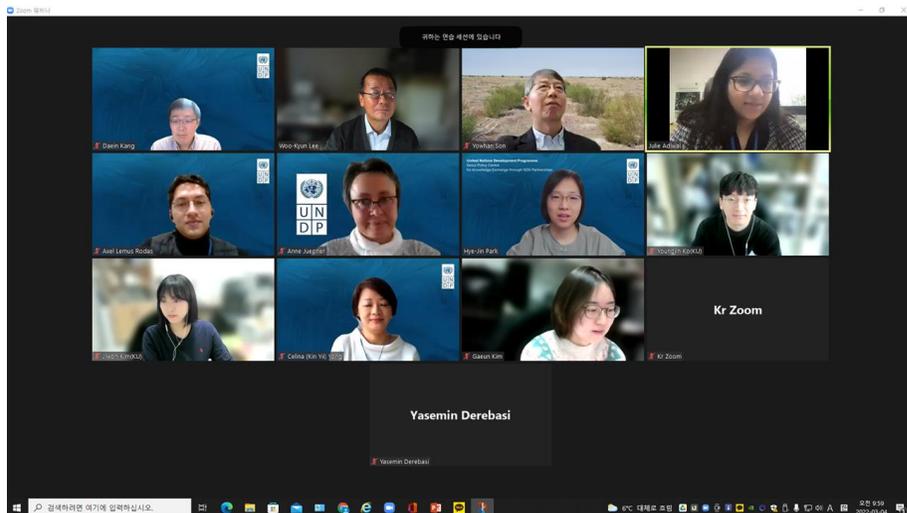
Woo-Kyun LEE

UNDP Seoul Policy Centre
for Knowledge Exchange through SDG Partnerships



Programme

Time	Programme	Speakers
5 mins	Welcoming remarks	Dr. Anne Juepner, Acting Director, UNDP Seoul Policy Centre
15 mins	Green transition and Nbs/sustainable forestry from a global UNDP perspective	UNDP
15 mins	Green transition and Nbs/sustainable forestry from a regional UNDP perspective	Ms. Celina Yong, Senior Regional Technical Advisor & Stakeholder Engagement Specialist, Climate and Forests
25 mins	The ROK's experiences with Nature-based Solutions SDG Policy Brief No. 11 Sharing the Experience of the Republic of Korea in Nature-based Solutions Approaches	Dr. Yowhan Son, Professor, Division of Environmental Science and Ecological Engineering Korea University
25 mins	The ROK's experiences with Urban Green Spaces SDG Policy Brief No. 12 Using Urban Green Spaces in the Pandemic: Example from the Republic of Korea	Dr. Woo-kyun Lee, Professor, Division of Environmental Science and Ecological Engineering Korea University
10 mins	Q&A session (with panelists and virtual participants)	Dr. Yowhan Son, Professor, Division of Environmental Science and Ecological Engineering Korea University
2 mins	Closing remarks	Dr. Anne Juepner, Acting Director, UNDP Seoul Policy Centre



- Axel Lemus Rodas님이 모두에게 10:15 AM
- Please post any questions
- Mariano de Deus님이 모두에게 10:20 AM
- What is the role of the bank/financial institution in addressing the issue of climate change in a country? (Based on Korea's experiences)
- Yoo Jung Kwon님이 모두에게 10:32 AM
- Thank you for the informative presentation. Raising a question if there are any countries that are currently applying afforestation or reforestation projects, similar to Korea's national rehabilitation policy? And are there any lessons that they can learn from Korea's experience or are there any lessons/innovations that we can learn from?
- Lexie Milan님이 모두에게 10:42 AM
- Question for Mr. Yowhan Son: Which agencies/stakeholders were responsible for implementing these 10-yr forest rehabilitation plans in Korea?
- Celina Yong (UNDP)님이 모두에게 10:42 AM
- Mariano, that is a great question. Banks/IFIs are a very important (and often missed) partner in addressing climate change. They can incentivise green investments by including such criteria in their portfolio, e.g., loans etc. There is increased attention to embedding strong ESG (environmental, social and governance) criteria, but some banks/IFIs are already thinking beyond the ESG, e.g., exclusion lists of sectors etc.
- Mariano de Deus님이 모두에게 10:46 AM
- Thank you!
- Jookyung Lee님이 모두에게 10:47 AM
- Professor Son highlighted Korea's successful reforestation and how the experience was shared with other countries, I wanted to know what are some current challenges that the forestry sector faces in Korea and any potential or ongoing solutions that might be useful lessons for other countries?
- Seohyeon Kim님이 모든 토론자에게 10:51 AM
- Thank you for your insightful presentation, Professor. Son.
- As forest restoration is emphasized around the world, the Bonn Challenge is also underway, and some criticize that large-scale planting of a single species hinders biodiversity or does not greatly help respond to the climate crisis. What are your thoughts on this?
- Jerrylynn Kariuki님이 모두에게 11:10 AM
- As noted in Prof Lee's presentation, urban greenery and green infrastructure is essential to increase urban adaptability and resilience to climate change and future pandemics. How can we make sure UGS continues to be as relevant in a post-pandemic world when other priorities take center stage?
- Celina Yong (UNDP)님이 모두에게 11:16 AM
- Here is a link to a YouTube video uploaded by UNDP Malaysia. This was a very insightful discussion on the roles of governments, monetary authorities and private sector in directing SDG-sensitive investments. It will give you a sense of what banks/IFIs are going. <https://www.youtube.com/watch?v=F3lFtzrc-g>
- Yongjin Kim님이 모두에게 11:18 AM
- Thank you UNDP USPC for hosting this webinar.

Thank you!

Jookyung Lee님이 모두에게 10:47 AM

Professor Son highlighted Korea's successful reforestation and how the experience was shared with other countries, I wanted to know what are some current challenges that the forestry sector faces in Korea and any potential or ongoing solutions that might be useful lessons for other countries?

Seohyeon Kim님이 모든 토론자에게 10:51 AM

Thank you for your insightful presentation, Professor. Son.

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Jerrylynn Kariuki님이 모두에게 11:10 AM

As noted in Prof Lee's presentation, urban greenery and green infrastructure is essential to increase urban adaptability and resilience to climate change and future pandemics. How can we make sure UGS continues to be as relevant in a post-pandemic world when other priorities take center stage?

Celina Yong (UNDP)님이 모두에게 11:16 AM

Here is a link to a YouTube video uploaded by UNDP Malaysia. This was a very insightful discussion on the

토론자(15)

참석자(20)

Q 참가자 찾기

- WL** Woo-Kyun Lee (나)  
- KZ** Kr Zoom (호스트)   
- AL** Axel Lemus Rodas (공동 호스트)   
- DK** Daein Kang (공동 호스트)   
- JA** Julie Adiwal (공동 호스트)   
-  Celina Yong (UNDP)  
- YS** Yowhan Son  
-  Anne Juepner  
-  Aram Sim  
- CS** Cholho Song 
- GK** Gaeun Kim  
-  Hye-Jin Park  
- JK** Jiwon Kim(KU)  
- YD** Yasemin Derebasi  
-  Youngjin Ko(KU)  

토론자(15)

참석자(21)

Q 검색

- BM** Byeongsan Min
- DW** David Woo
- GK** Gyeongcheol Kim
- HC** Hojin Chung
- JK** Jerrylynn Kariuki
- J(** Jeunghyuk (Jason) Lee
- JK** JH Kim
- JL** Jookyung Lee
- LM** Lexie Milan
- MD** Mariano de Deus
- MH** Minhyuk Hong
- NM** Navid Mahlooji
- SC** Sara Ceddia
- SK** Seohyeon Kim
- SK** Sooji Kim
- SK** Sujin Kim
- YK** Yongjin Kim
- YJ** Yoo Jung Kwon
- YL** Yoonha Lee
- YK** Young-Ji Kim
- 지** 지영 활