Developing Spatial Indicators For The Territorial Monitoring of South Korea

Eun-Sun Im¹, Young-Joo Lee¹, Myung-Hwa Hwang¹, Bo-Kyeong Lee¹†

¹ Korea Research Institute for Human Settlements, † Presenter
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I. Overview of National Territorial Survey & Monitoring Indicators
The Progress of Territorial Survey in South Korea

- **Survey of basic data and info needed for spatial planning and policy development**
  - Survey results are used as fundamental data sets for the territorial monitoring
  - The function and method of the territorial survey have changed with the paradigm shift in national territorial policies, and now start to using a crucial survey data for support smart urban policies

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**Territorial Survey**

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
</tr>
</thead>
</table>

- National land development and growth
- National land development and conservation, balance and harmony
- National land management, regeneration and creative economy
- Smart national land innovation and Inclusive growth

*Start to develop grid based spatial indicators*
Process & Roles of Territorial Monitoring

- Process of investigating countermeasures for future territorial policies through
  1) Regular observations and analyses of territorial changes,
  2) Diagnosis of the status quo of the territory and forecasting of its further changes,
  3) Objective evaluation of the outcomes of current policies and plans

Policy Process
- Plan
- Do
- Check
- Adjust/Action

System of The Territorial Monitoring
- Check Policy Outcomes
- Observe The Status quo and Changes
- Monitoring of Policy Indicators
  - Balanced Development
  - Competitive Land
- Monitoring of Status Ind.
  - Population
  - Economy
  - Infrastructure
  - Environment
- Territorial Survey (Production of Spatial Indicators)
  - Diagnosis/Prescription
  - Monitoring of Territorial Policies
- Monitoring of Territorial Changes
- Release Outputs

Monitoring Support Groups
- Department of Territorial Policies & Planning

Citizen & Private Sector
- Experts
- Civic Organizations
- Other Institutes

Monitoring of Citizens’ Satisfaction & Opinions
- Education & Promotion
- Feedbacks
- Data
Framework of Spatial Indicators for the Territorial Survey

Sustainable Development Of National Land

Policy Goals
- Depopulation
- Small or medium cities
- Access to living infrastructures
- Regional gaps
- ...

Balanced Development
- SOC supply
- Deterioration of SOC
- Land productivity
- Use of unused land
- Smart cities
- ...

Competitive National Land
- Pollution levels
- Use of green transportation infra
- Mixed use of land
- Safety of national land
- ...

Environment-oriented Management
- Accessibility to living infra
- Enjoyment of cultural activities
- Barrier-free land use
- Safety of daily lives
- ...

Improvement of Quality of Life

Status Indicators

General-purpose indicators of population, housing, land use, infrastructure, and others

The Framework Act On The National Land
Operation of the Territorial Survey

- Through Collaborative Governance Among MOLIT (Ministry of Land, Infrastructure and Transport), NGII (National Geographic Information Institute), KRIHS, and Others.
II. Development of Grid based Spatial Indicators
Production of Grid-based Indicators

- Population & Buildings

Population Registry System

Population Registry Record + Location

Birth year, sex, address, X, Y ...

Grid-based Indicators

Up-to-date Building Address & Geometry

Building Address & Centroid

MOIS, Road Name Address Info Sys

Building Registry System

Building Registry Record + Location

Parcel code, bldg name, ..., address, X, Y ...

Address-based Geocoding

Address-based Geocoding

Birth Year
Sex
Address

Min. of The Interior & Safety, (MOIS) Population Registry Information System

MOLIT Architecture Info Sys

Parcel Code
Bldg Name
Permit Date
...
Address
Production of Grid-based Indicators

Accessibility to Living Infrastructure Facilities

**Concept**
- Accessibility to preschool
- Accessibility to emergency medical center
- Accessibility to library

**Measurement**

Accessibility = Moving Distance on Road Network from the centroid of a grid cell to its nearest living infrastructure facility

\[ \text{Accessibility} = D_a + D_{ab} + D_b \]
Production of Grid-based Indicators

- Accessibility to 10 Types of Living Infrastructure Facilities

- 500m grid

1. Preschool
2. Sports Center
3. Welfare
4. Hospital
5. Emergency
6. Local clinic
7. Library
8. Culture center
9. Parking lot
10. Public park
Production of Grid-based Indicators

- Accessibility to Living Infrastructure Facilities

Accessibility to Living Infrastructure Facilities

Sejong City

Gyungju City
Production of Grid-based Indicators

- Accessibility to Living Infrastructure Facilities

Finding target area for needed improvement of parking facilities
Ⅲ. Publication of Territorial Monitoring Report
From The Territorial Survey to Territorial Monitoring Report

- Analysis of indicators of territorial policies and derivation of policy implications

Findings
- Regions having less population shows worse accessibility to the pre-school.
- The ratio of under 6 year-old population which apart from pre-school more than 5 km is high in some of Jeon-ra coastal area including Jindo and Haenam.
- Further analysis considering a level of supply in each region is necessary.

References for Evidence based Policy Design
(Diagnosis/Prescription)
From The Territorial Survey to Territorial Monitoring Report

- 2017 Territorial Monitoring Report – The first official report
Example of Territorial Monitoring Report

Accessibility to preschool

<Fig1. Accessibility to the pre-school per 500m x 500m grid>

<Fig2. Average of accessibility to the pre-school (Administrative unit)>

<Fig3. Standard Deviation of accessibility to the pre-school (Administrative unit)>
IV. Use of Grid based Spatial Indicators for K-SDGs
### Development of K-SDGs

- South Korea is working on developing the National Sustainable Development Goals of Korea (K-SDGs)

- Based on UN SDGs, K-SDGs try to consider **national needs, public demand, and the level of development of Korea as well as its economic, social, and environmental circumstances.**

<table>
<thead>
<tr>
<th>UN SDGs</th>
<th>Korean Conditions</th>
<th>Priority for K-SDGs’ targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Relevant Policy of Korea</td>
<td>Meet the goal by 2018</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Distinctive Needs of Korea</td>
<td></td>
</tr>
<tr>
<td>No</td>
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</tbody>
</table>

South Korea is working on developing the National Sustainable Development Goals of Korea (K-SDGs)

Based on UN SDGs, K-SDGs try to consider **national needs, public demand, and the level of development of Korea as well as its economic, social, and environmental circumstances.**
Development of K-SDGs

- Expert groups and stakeholders are trying to decide K-SDGs and develop their specific targets and indicators (will be determined around December 2018)
- An expert group including relevant government agencies, academia and civil society, called K-MGoS (Korea-Major Groups and Other Stakeholders), proposes targets and indicators of K-SDGs with diverse views and expectations of sustainable development.

<table>
<thead>
<tr>
<th>UN SDGs Indicators</th>
<th>K-SDGs Indicators</th>
<th>Data Availability</th>
<th>Types of Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>→</td>
<td>A (UN SDG Indicator)</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>→</td>
<td>B (Existing National Indicator)</td>
</tr>
<tr>
<td>X</td>
<td>0</td>
<td>→</td>
<td>C (New K-SDGs Indicator)</td>
</tr>
<tr>
<td>0</td>
<td>X</td>
<td>→</td>
<td>A (UN SDG Indicator)</td>
</tr>
</tbody>
</table>

NGII and KRIHS have proposed some of grid-based spatial indicators as Type B indicators of K-SDGs
Examples of Grid-based Spatial Indicators for K-SDGs

**SUSTAINABLE DEVELOPMENT GOAL 11**
Make cities and human settlements inclusive, safe, resilient and sustainable

(UN SDGs 11-3)
By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

K-SDGs (11-3) tries to emphasize the issues associated with unplanned urban expansion, such as “Mixed Land-Use”, “Compact City”, and “Prevention of Urban Sprawl”.

Grid-based Spatial Indicators
- Population Density
- Number of buildings
- Gross floor area
- Level of Mixed Use (ex. Dissimilarity Index)

< Distribution of gross floor area (1km x 1km grid)>
Examples of Grid-based Spatial Indicators for K-SDGs

**SUSTAINABLE DEVELOPMENT GOAL 11**
Make cities and human settlements inclusive, safe, resilient and sustainable

(UN SDGs 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

K-SDGs (11-7) focuses on “Accessibility to Urban Greenery” for all.

Grid-based Spatial Indicators

- **Accessibility to Urban Greenery**
- **Ratio of population within a service area of urban greenery**

< Accessibility to Urban Greenery (500m x 500m grid)>
V. Concluding Remarks
Concluding Remarks

Sustainable Development of Korea

- NGII and KRIHS produce spatial indicators for territorial survey
  - To diagnose status and issues of urban and region
  - To monitor performances and outcomes of policies

- NGII and KRIHS promote application of spatial indicators
  - Publication of territorial monitoring report
  - Evaluation of sustainability and qualities of life
Thank You!

KRIHS (http://eng.krihs.re.kr/)

Bo-Kyeong Lee (bklee@krihs.re.kr)