Development & Application of Regional Safety Index in Korea

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1. Introduction

Definition

Index to evaluate the safety level of local government in 7 sectors* by using various statistics about safety

* ① Fire, ② Traffic Accident, ③ Natural Disaster, ④ Crime, ⑤ Safety Accident, ⑥ Suicide, ⑦ Infectious Disease

Objective

To reinforce the responsibility of l. g. for safety management by evaluation the safety level objectively and encourage the local government to improve the vulnerable sectors voluntarily

Legal Basis

Based on Article 66-7, 8 (Public Announcement of Safety Index)* of Framework Act on the Management of Disasters and Safety

* "The Minister of the Interior and Safety may develop and survey an index that objectively indicates the safety level and safety awareness by area and publicly announce it."

1. Introduction

Development Background and Principles

3 No Principles to avoid additional working on local government and ensure reliability in developing the index

1st NO Ensure that the calculation of Regional Safety Index does become a task of the local government.**(No Additional Work)**

2nd NO Make sure that the competence of the evaluator does not influence the judgment of the local government's safety capability.**(No Evaluator)**

3rd NO The perfunctory safety-related projects, such as those that do not reduce the number of deaths and incidents, should not affect the level of Regional Safety Index.**(No Perfunctory Project)**

1. Introduction

	2015		2016		2017
	Draft Release(7.29)	1st Official Release(11.4)	Collecting Opinions of L.G.*	2nd Official Release(12.8)	Reflect the Opinions of L.G.*
Progress Contents	▪ 2 Sectors Pilot Release - Fire, Traffic Accident	▪ 7 Sectors Official Release - Fire, Traffic Accident, Crime, Safety Accident, Suicide, Infectious Disease, Natural Disaster - Improvement for Indicators of Fire, Traffic Accident, Natural Disaster	▪ Briefing Session for Local Government(8.2~4) ▪ 1st Meeting Local Government (10.26) ▪ 2nd Meeting Local Government(11.25)	▪ 7 Sectors Official Relese - Fire, Traffic Accident, Crime, Safety Accident, Suicide, Infectious Disease, Natural Disaster - Improvement for Indicators of Fire, Safety Accident, Infetious Disaese	▪ 1st Briefing Session for Local Government (6.20) ▪ 2nd Briefing Session for Local Government with Minister of Public Safety and Security (9.14)
Improvement	▪ (Fire) Num. of Deaths → Num. of Deaths + Num. of Fires ▪ (Traffic Accident) Excepting Deaths on Highway ▪ (Natural Disaster) Using 'Safety Index for Community Safety'	▪ (Safety Accident) Num. of Rescue & Emergency Medical Service → Num. of Emergency Medical Service ▪ (Infectious Disease) Num. of Infectious Disease Deaths → Num. of Legal Communicable Disaese	▪ (Fire) Excepting Deaths caused by Traffic Accident	▪ Examining Opinions	▪ Examining Opinions ▪ Show Improvement Suggestion from Reasonable Opinions → Collecting Opinions of L.G. (2nd Briefing Session) ▪ 3rd Official Release('17) Reflected Improvements

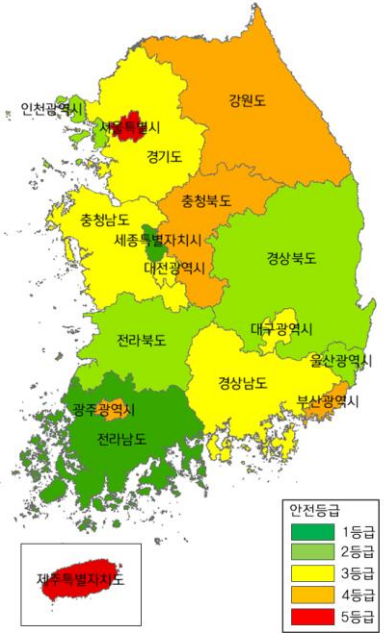
* L.G. : Local Government

2. Regional Safety Index Announcement in 2016

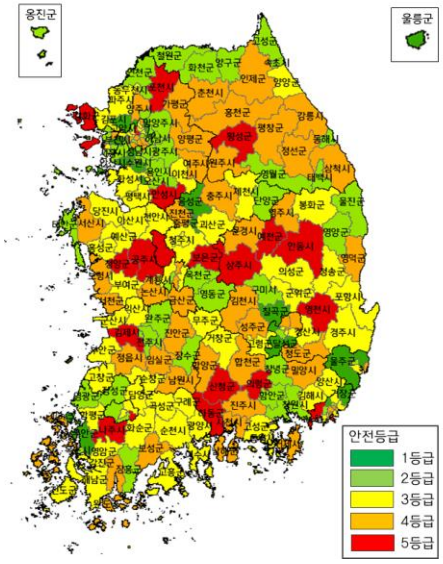
2nd Official Release in 2016(2016.12.08)

* Parts of 7 Sectors, Fire and Crime

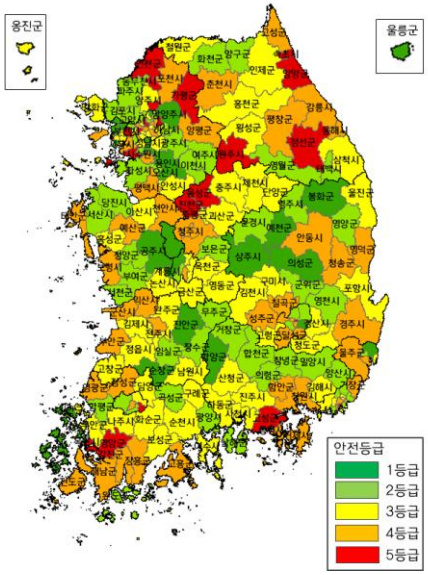
<Fire on City/Province>



<Crime on City/Province>



<Fire on City/County/District>



<Crime on City/County/District>

2. Regional Safety Index Announcement in 2016

Reason of Level Change(2015→2016)

Hazard Indicator(Num. of causalities and accidents) is the Major Reason of Level Change

Sectors	Upgrading			Downgrading		
	Num. of L.G.	Num. of L.G. decreased Hazard Indicator	Ratio	Num. of L.G.	Num. of L.G. increased Hazard Indicator	Ratio
Fire	64	63	98%	66	58	88%
Traffic Accident	48	47	98%	45	44	98%
Crime	43	41	95%	39	33	85%
Safety Accident	52	30	58%	48	48	100%
Suicide	57	56	98%	60	57	95%
Infectious Disaese	52	45	87%	53	45	85%
Natural Disaster	57	57	100%	70	36	51%
Average	53	48	91%	54	46	85%

2. Regional Safety Index Announcement in 2016

Num. of fire incidents, traffic accidents, and deaths due to suicide decreased and the num. of the fifth violent crimes decreased

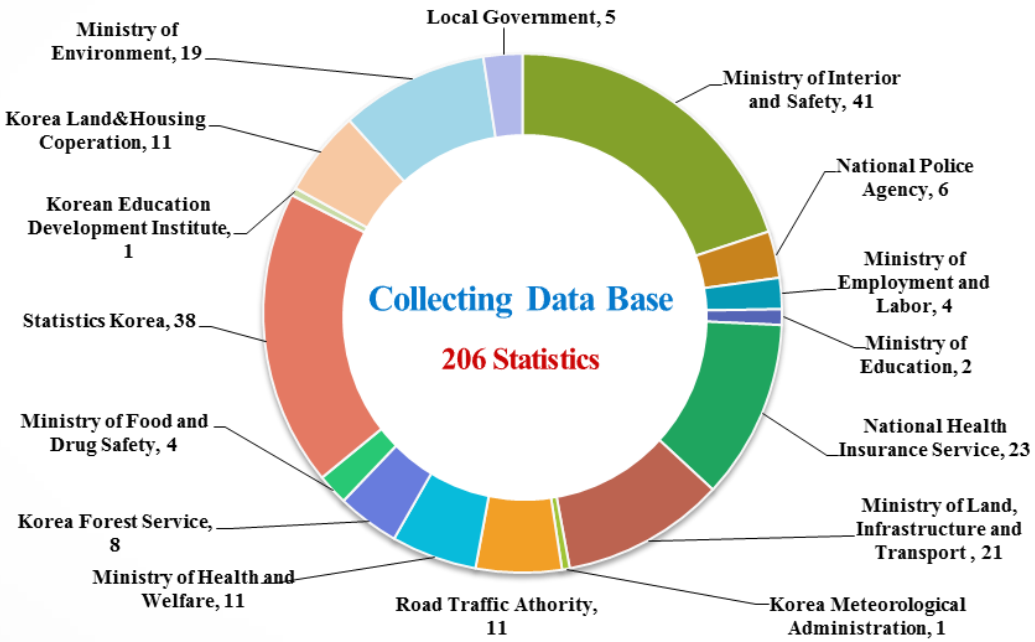
Sectors	Hazard Indicators	2014	2015	Variation(Ratio)
Fire	Num of Deaths	322	249	↓ 73 (22.7%)
	Num. of Fires	41,624	43,915	↑ 2,291 (5.5%)
Traffic Accident	Num. of Deaths	4,489	4,380	↓ 109 (2.4%)
Crime	Num. of the Fifth Violent Crimes	578,334	560,813	↓ 17,521 (3.0%)
Safety Accident	Num of Deaths	148,943	158,123	↑ 9,180 (6.2%)
Suicide	Num of Deaths	13,836	13,513	↓ 323 (2.3%)
Infectious Disaese	Num of Deaths	2,765	2,798	↑ 33 (1.2%)
Natural Disaster	Result of 'Safety Index for Community Safety'	0.739	0.651	↑ 0.088 (11.9%)

3. Evaluation Process

Statistics related to Safety

Statistics Data Base

17 Dep. and Agencies / Established 206 Statistic DB(2007~2015)



	Dep. & Agency	Statistics
1	National Police Agency	Crime related, Car accident related
2	Ministry of Employment and Labor	Industrial accident related
3	Ministry of Education	Education related
4	National Health Insurance Service	Num of Healthcare Provider, etc.
5	Ministry of Land, Infrastructure and Transport	Land & Road Traffic related
6	Korea Meteorological Administration	Special Weather Report
7	Road Traffic Athority	Traffic Accident, Death, etc.
8	Ministry of Health and Welfare	Basic received people and health protection related
9	Korea Forest Service	Landslide and forest fire related
10	Ministry of Interior and Safety	Fire-related, Natural disaster related
11	Ministry of Foodand Drug Safety	Food safety and Poising related
12	Statistics Korea	Cause of death & business statistics, etc.
13	Korean Education Development Institute	Num of Students
14	Korea Land&Housing Coperation	Rate of Urbanization, Resident Registration, etc.
16	Ministry of Environment	Environment related
17	Local Government	Statistics by Local Government

Meaning of Hazard, Vulnerability, and Mitigation Indices

Num. of deaths and incidents by Sectors

Deaths of Traffic Accident, Num. of five Major Crimes, etc.

Becomes the human and material factors causing harm

Disadvantaged people, Population density, etc.

Prevent and counteract the occurrence of harm in advance

Num. of Bed Hospitals, Financial Independence Ratio, etc.

3. Evaluation Process Key Indicators

	Hazard	Vulnerability	Mitigation
Fire	Conversion fatality	Disadvantaged people, Num. of Employees in Restaurants and Bars, Num. of Warehousing and Transportation Companies	Num. of bed hospitals, Financial Independence Ratio, Area of Urban District
Traffic Accident	Fatality	Disadvantaged People, Num. of Basic Livelihood Security Recipients, Num. of Business Place Provided Medical Security, Num. of Registered Vehicles	Num. of Medical Institutions, Population Density, Num. of Rescue and Relief Workers
Crime	Number of the Fifth Violent Crimes	Num. of Total Incomers, Population density, Num. of Basic Livelihood Security Recipients, Num. of Manufacturing Companies, Num. of Restaurants and Bars	Num. of Police Offices
Safety Accident	Number of Occurrence	Area of stream, Area of forest, Disadvantaged people, Num. of Incomers from Other Region, Num. of Employees in Construction Industry, Num. of Employees in Manufacturing	Medical Insurance Premium
Suicide	Fatality	Num. of Elderly People, Num. of Naturalized Korean Citizen Caused by Marriage, Num. of Employees in Restaurants and Bars, Num. of Basic Livelihood Security Recipients	Num. of Employees in Health Care and Social Welfare Service
Infectious Disaese	Fatality	National Health Service Budgets, Num. of Elderly People, Num. of Basic Livelihood Security Recipients,	Num. of Employees in Health Care and Social Welfare Service, Influenza Vaccination Rate
Natural Disaster	Result of '**Safety Index for Community Safety**'		

3. Evaluation Process Sectors and Model

Numerical value objectively indicating the safety level of each region (city/province/county/district) by selecting key indicators from safety statistics of national or public agencies(2016 Index was calculated from 2015 statistics)

Sectors

Fire	Traffic	Natural Disaster	Crime	Safety Accident	Suicide	Infectious Disaese

Model

Safety Index = 100 - (Hazard Ind. + Vulnerability Ind. - Mitigation Ind.)

$$= 100 - \left\{ \sum_{i=1}^{n} (\omega_i \times H_i) + \sum_{j=1}^{m} (\alpha_j \times C_j) - \sum_{k=1}^{o} (\beta_k \times M_k) \right\}$$

ω_i : Weight of Hazard Ind. H_i Score of Hazard Ind.

α_j : Weight of Vuln. Ind. C_j : Score of Vuln. Ind.

β_k Weight of Miti. Ind. M_k Score of Miti. Ind.

Natural Disaster Sector

- Using the results of 'Safety Index for Community Safety'
- Announced annually for 228 cities/counties/districts based on Countermeasures against Natural Disaster Act Article 75-2

Division	Safety Index for Community Safety	Way to Conversion
Score	The lower value means safer	① Score : 1-Score at 'Safety Index for Community Safety' ② Conversion to Final Score(Conversion to Highest Score : 100, Lowest Score : 40)
Level	10 levels	5 levels
Classification by Region Level	No Result by Region Level	Average for Score of Citie(Si)/Countie(Gun)/District(Gu)

3. Evaluation Process

Items and Detailed Indices of Safety Index for Community Safety

Category	Indicators		
Risk Environment (13)	Frequency of Natural Disaster During Decade		
	Scale of Damage		
	Risk Factor from Natural Disaster	Social Risk Factor	
		Geological Risk Factor	
Risk Management Capability (16)	Common Indicators		
	Risk Factor from Natural Disaster	River Disaster	
		Inundation Disaster	
		Slope & Soil Erosion Disaster	
		Seaside Disaster	
		Etc.	
Prevention Performance(18)			

3. Evaluation Process

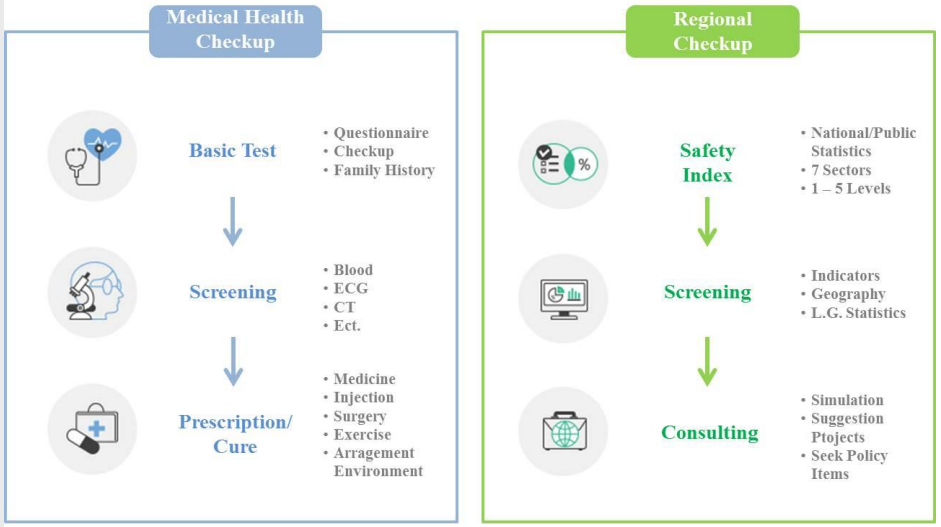
Way to Calculate Safety Index

- Safety levels are expressed for each seven Sectors(No Comprehensive Level)
- Levels are given by groups, such as metropolitan city, province, city, county, and district, with considering the regional characteristics
- The ratios of levels are considered the standard deviation of city/county/district

Classification		Level 1	Level 2	Level 3	Level 4	Level 5
Ratio		10%	25%	30%	25%	10%
Num.	MetroPolitan City	1	2	2	2	1
	Do	1	2	3	2	1
	Si	7	19	22	19	8
	Gun	8	20	25	21	8
	Gu	7	17	21	17	7

Regional Safety Diagnosis System

- Operated to help local governments to strengthen their safety capabilities subjectively



< Conception >

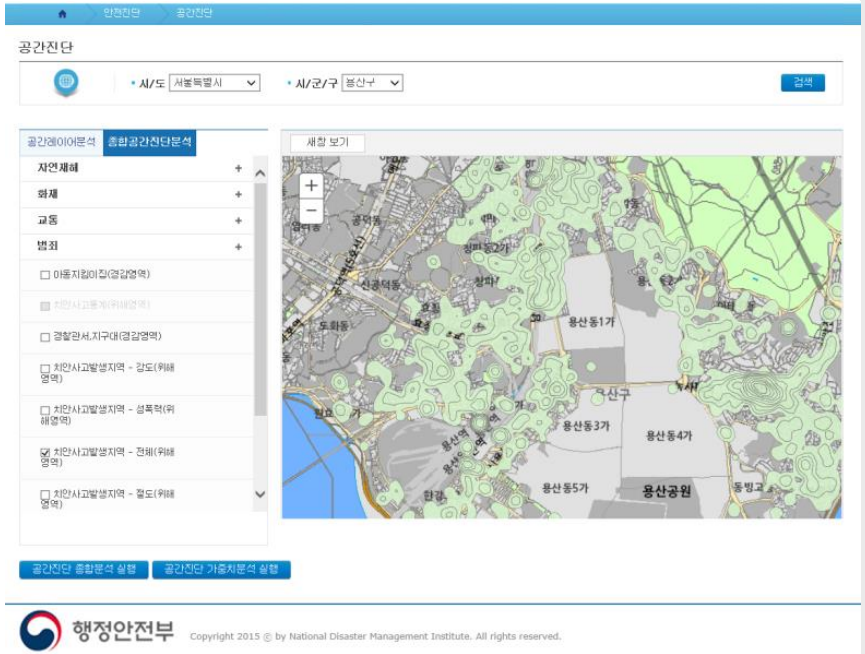
< Main Window>

4. Utilization of Regional Safety Index

Regional Safety Diagnosis System

< Safety Index Search Function Window>

<Spatial Diagnosis Function Window>



Local Government Consulting

Support the local government consulting by to strengthen regional safety capabilities

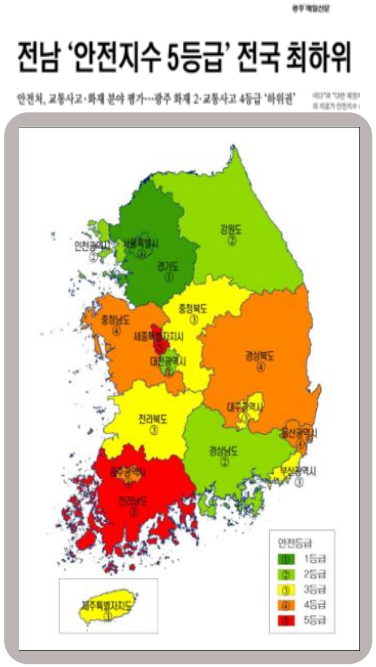
Identifying the Vulnerable Sector

Safety Situation Analysis

Providing Reduction Target and Policies

5. Effects of Regional Safety Index Subjective Efforts and Improvement

Pilot Relese (2015. 07)

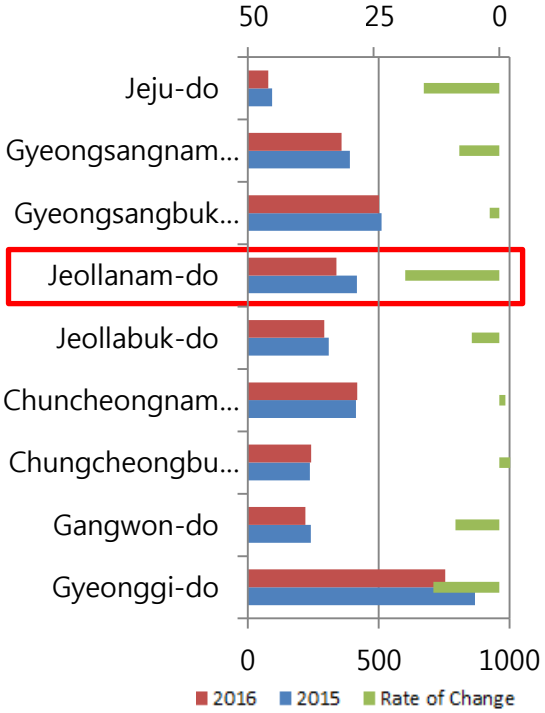


<2015 Safety Level of Traffic Accident >

Attention / Effort

<Case of safety culture movement On Jeonnam Province >

Result



<Change of Deths by Traffic Accident>

5. Effects of Regional Safety Index TF Composition and Operation

17 cities and provinces have composed and run TF to understand and improve Safety Index (Consultative groups in response to Regional Safety Index)

Thank you