



Climate Change and Disaster Statistics in Republic of Korea

Youngshil Park
(youngshil@korea.kr)

Statistics Research Institute, Ministry of Data and Statistics

Contents

Why Climate Change and Disaster Statistics Matter?

Climate Change and Disaster Data Governance in Korea

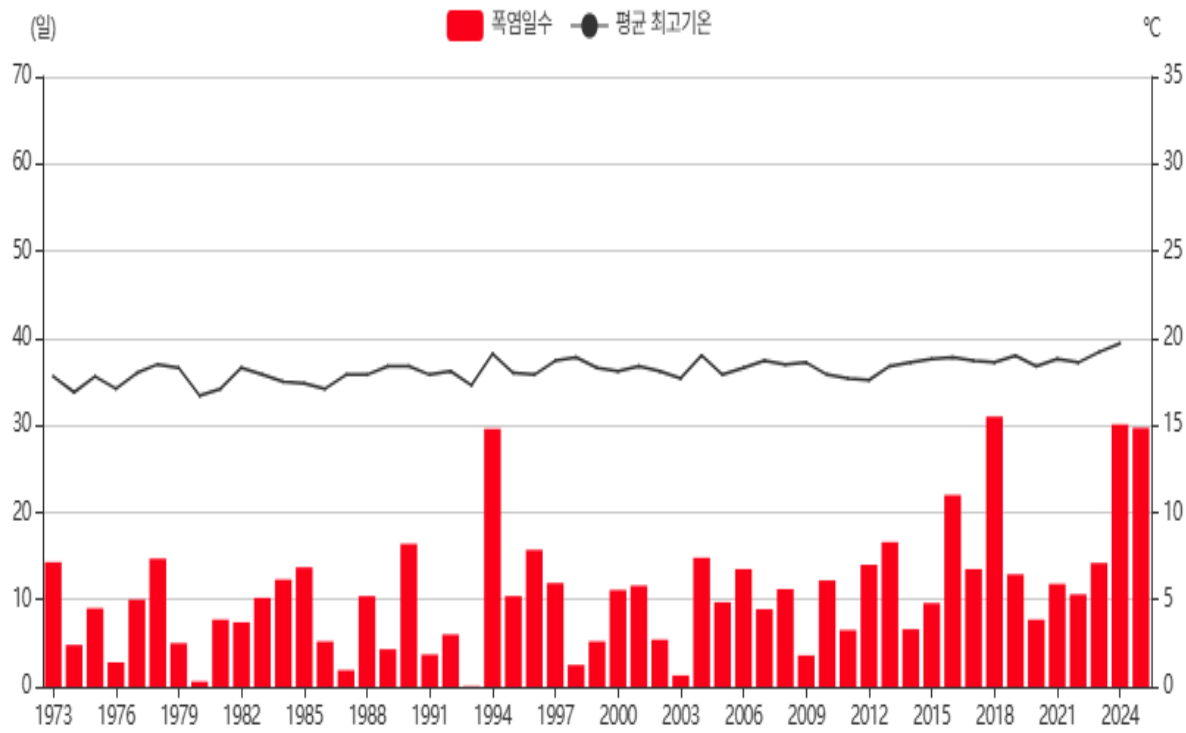
How to Apply Global Indicator to National Context

Heat waves



지난달 30일 대구 중구 국채보상운동기념공원에 쿨링포그(안개형 냉각수)가 가동 중인 가운데 한 시민이 양산을 들고 이동하고 있다. 연합뉴스 제공

Number of heatwave days
Average maximum temperature



A Heat-related illness patients

※5월 15일~8월 24일 기준

단위: 명

누적 환자수

4048

추정 사망자수

26



Wildfire

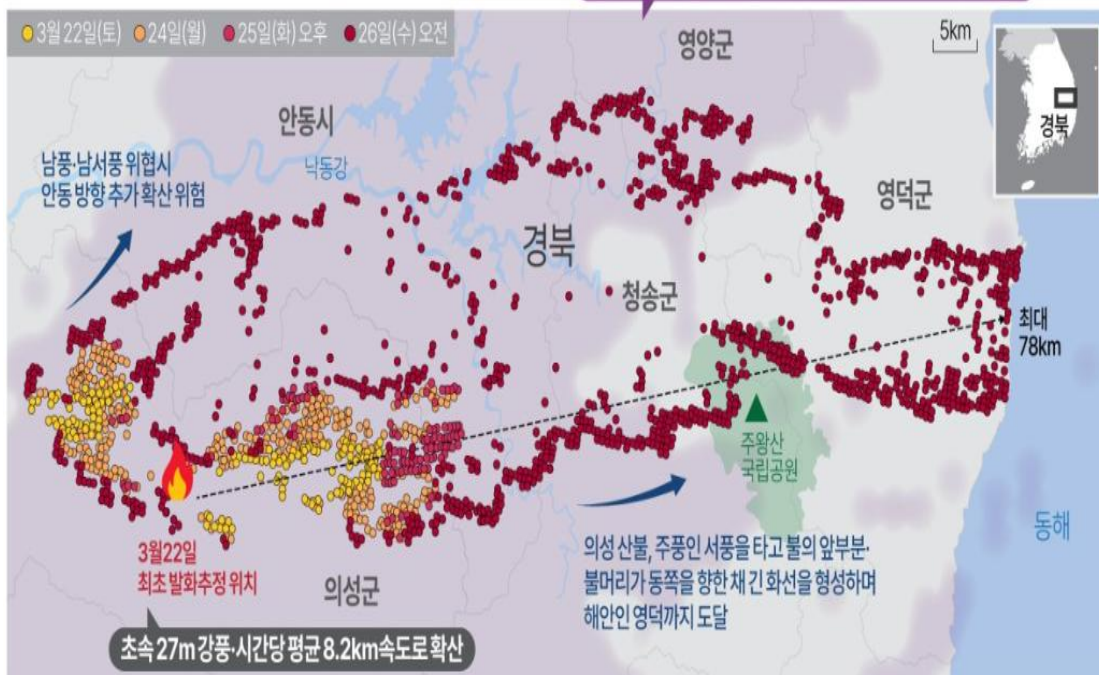


경북 의성군 산불 발생 이틀째인 23일 안평면에서 산불이 번지고 있다. 2025.03.23 문재원 기자

22~26일 경북 북부 산불 확산 현황

3월 25일 기준 미국 가시적외선 이미지 센서(S-NPP 위성) 열 탐지 결과 기반

27일 경북 일부 지역 시간당 1mm 이내 비(오후 9~10시 강수 지역)



연암뉴스 자료: 국립산림과학원, 기상청

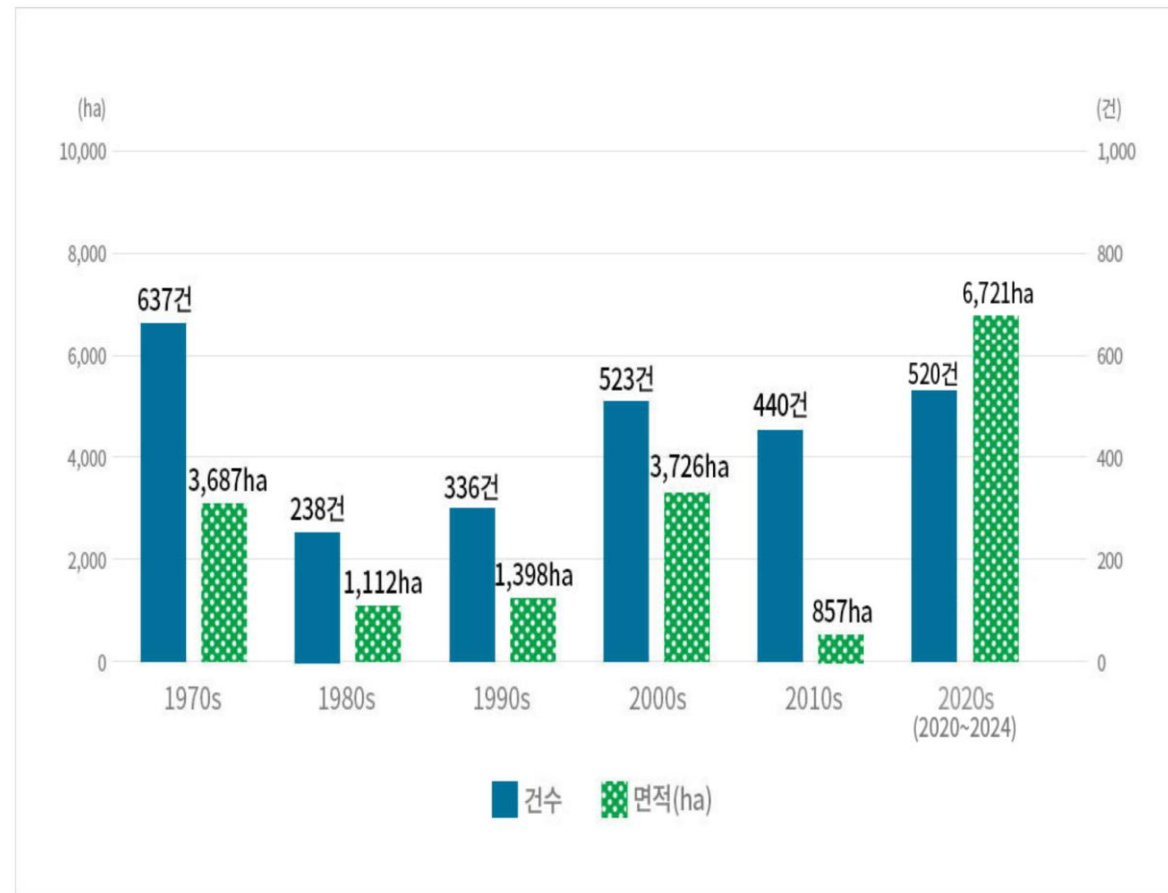
이재윤 기자 = yoon2@yna.co.kr/20250327

I

What happened to Korea in 2025



경북 의성에서 발생한 산불이 사흘째 이어지고 있는 24일 경북 의성 안평면 신월리 피해지역에서 이복희씨 (70)가 산불에 전소된 아들집을 바라보고 있다. 문재원 기자



Droughts



지역 87%의 생활용수를 공급하는 상수원 강릉 오봉저수지가 바짝 말라 있다. 오봉저수지의 저수율이 31일 14.9%로 뚝 떨어져 역대 최저치를 기록했다. 연합뉴스



최악 가뭄에 농업용수 공급이 중단된 가운데 1일 강원 강릉시 한 대파밭에 심어진 파가 말라가고 있다. 연합뉴스

Contents

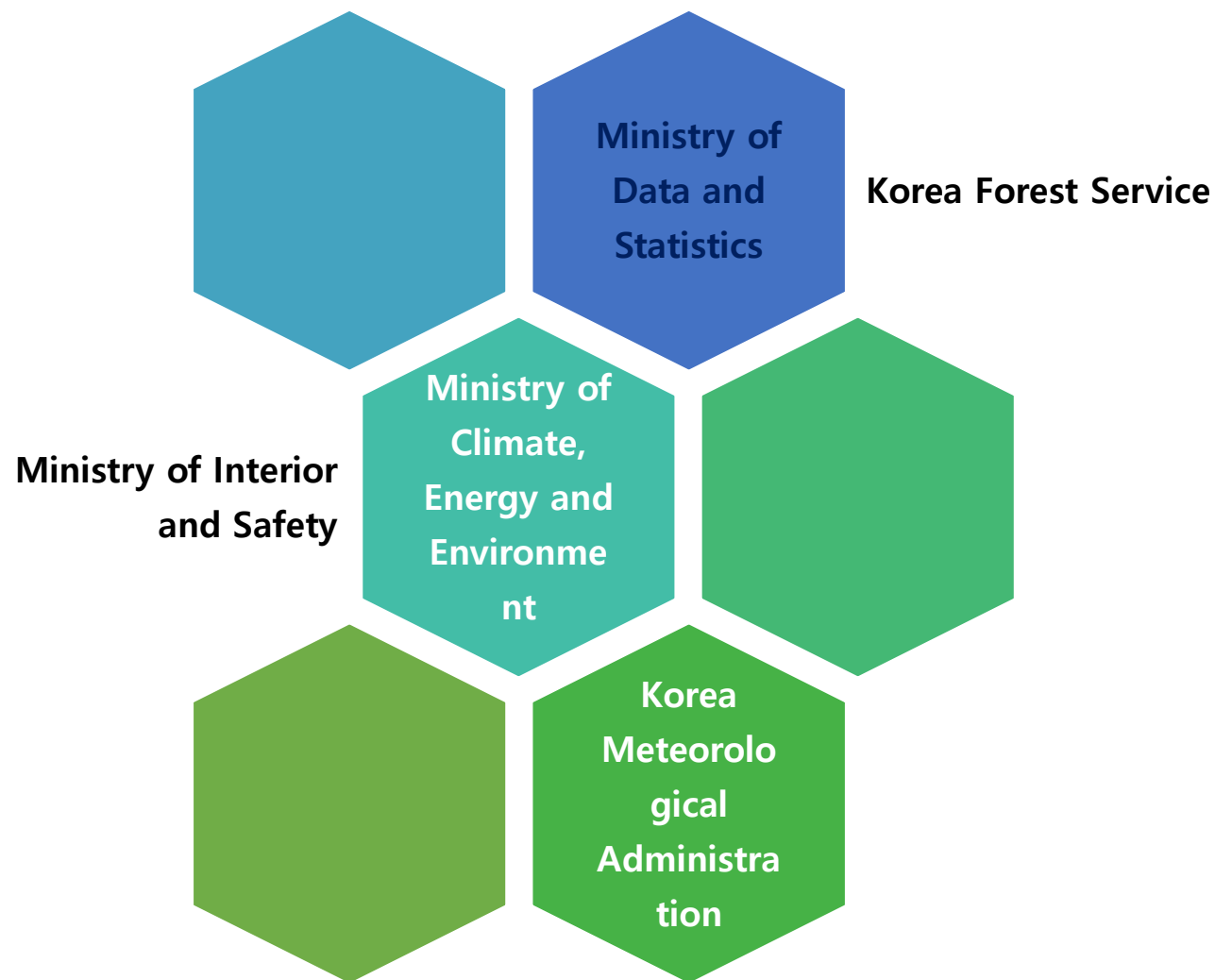
Why Climate Change and Disaster Statistics Matter?

Climate Change and Disaster Data Governance in Korea

How to Apply Global Indicator to National Context

II

Ministries Producing Climate Change Statistics



- MCEE : Greenhouse gas and Environment Statistics like drought
- KMA : Meteorology Statistics
- KFS: Wildfire Statistics
- MAFRA: Drought, Food, Agriculture
- **MIS: Disaster Statistics**
- MODS : Coordination

Data Service

- **KOSIS : Korea Statistical Information Service (<http://kosis.kr>)**
- **SGIS : Statistical Geographical Information System (<http://sgis.kostat.go.kr>)**

Research on Climate Change Statistics

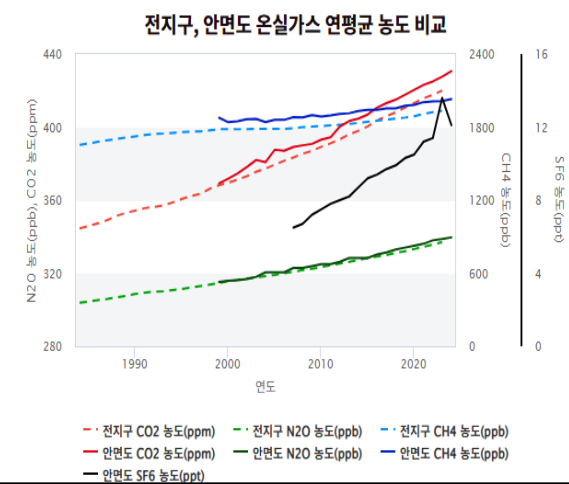
- **Started researches in 2023**
- **Focusing on National Climate Change Indicator**



KOSIS



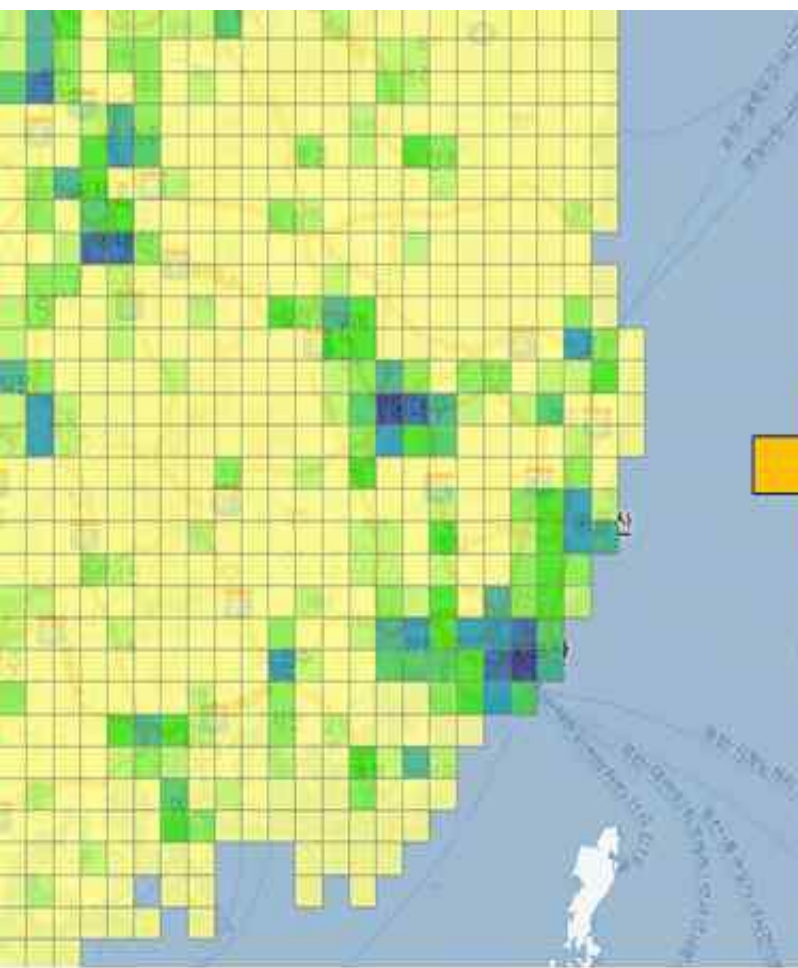
※ '25.08. 최신정보 수정 / '26.08. 다음 업데이트 예정



안면도(1999~2024)와 전지구(1984~2024)의 이산화탄소, 메탄, 아산화질소, 육불화황의 연평균농도로 지속적으로 증가하고 있음을 보여준다.

II

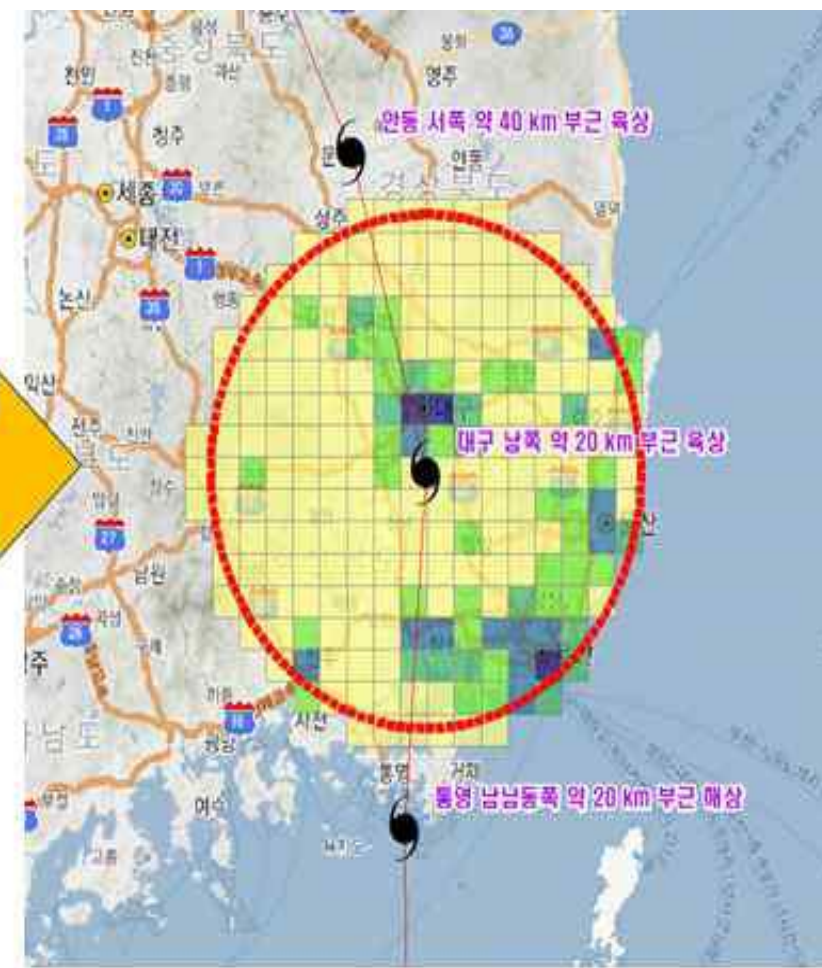
Climate Change and Disaster Data Service_SGIS



인구·사업체 등 공간통계DB



자연재해 영향범위

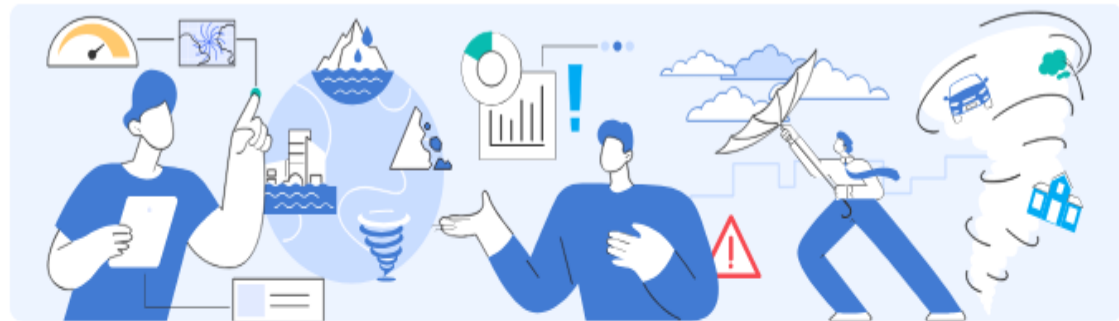


재해 영역 내 공간통계정보

II

Climate Change and Disaster Data Service_SGIS

자연재해 통계지도 서비스



태풍, 홍수, 산사태, 폭염 등의 자연재해 영역과 공간통계정보를 융합하여 자연재해 영향범위 안에 있는 인구, 사업체 등의 통계정보를 제공하는 서비스입니다.

* 30일이 경과한 특보는 '과거특보'에서 확인 할 수 있습니다.

재난정보

- 태풍 | 과거태풍(기상청)
- 홍수 | 홍수위험지도(한강홍수통제소)
- 산사태 | 산사태위험지도(산림청)
- 폭염 | 과거폭염(기상청)

통계정보

- 인구
- 주택
- 사업체
- 야외 사업체
- 가구
- 건물
- 농경지 면적
- 배달 사업체

☐ 일주일간 이 창을 열지 않음

확인

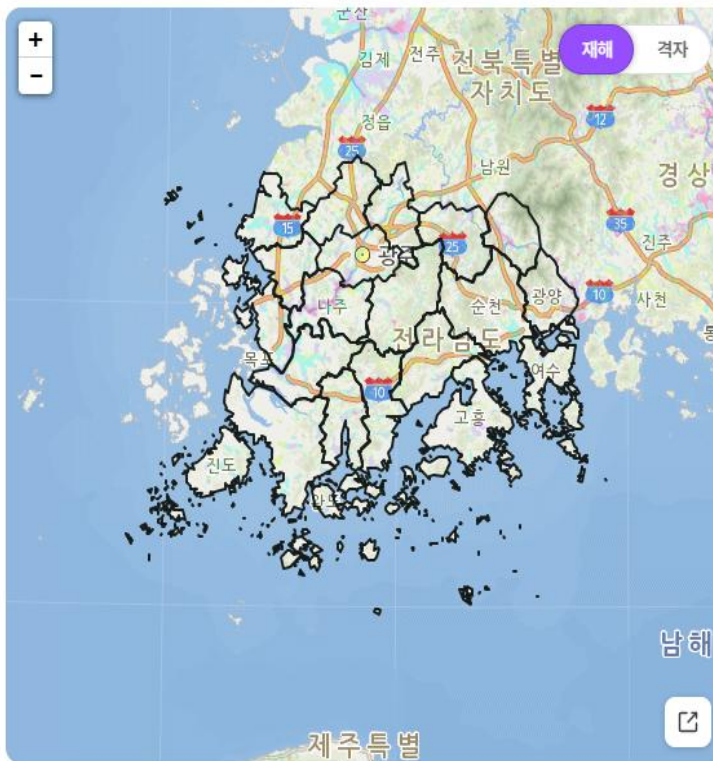
데이터보드

홍수위험지도 | 2023 | 지역: 전라남도 전체 | 홍수위험 | 2023 입수

전라남도 | 전체 | 전체

전라남도 전라남도 전체 전체

통계분석조회



재해범례

- 0.5m 미만
- 0.5m ~ 1.0m
- 1.0m ~ 2.0m
- 2.0m ~ 5.0m
- 5.0m 이상

격자 정보

- 격자크기: 1 Km * 1 Km
- 영역 내 격자 개수: 3,853개
- 격자 면적: 3,853km²

인구

(기준년도: 2023, 단위: 명)

행정구역내 1,776,829

영향구역내 590,414



노후건물

(기준년도: 2023, 단위: 개)

행정구역내 361,109

영향구역내 160,845



사업체

(기준년도: 2023, 단위: 수)

행정구역내 224,304

영향구역내 83,937



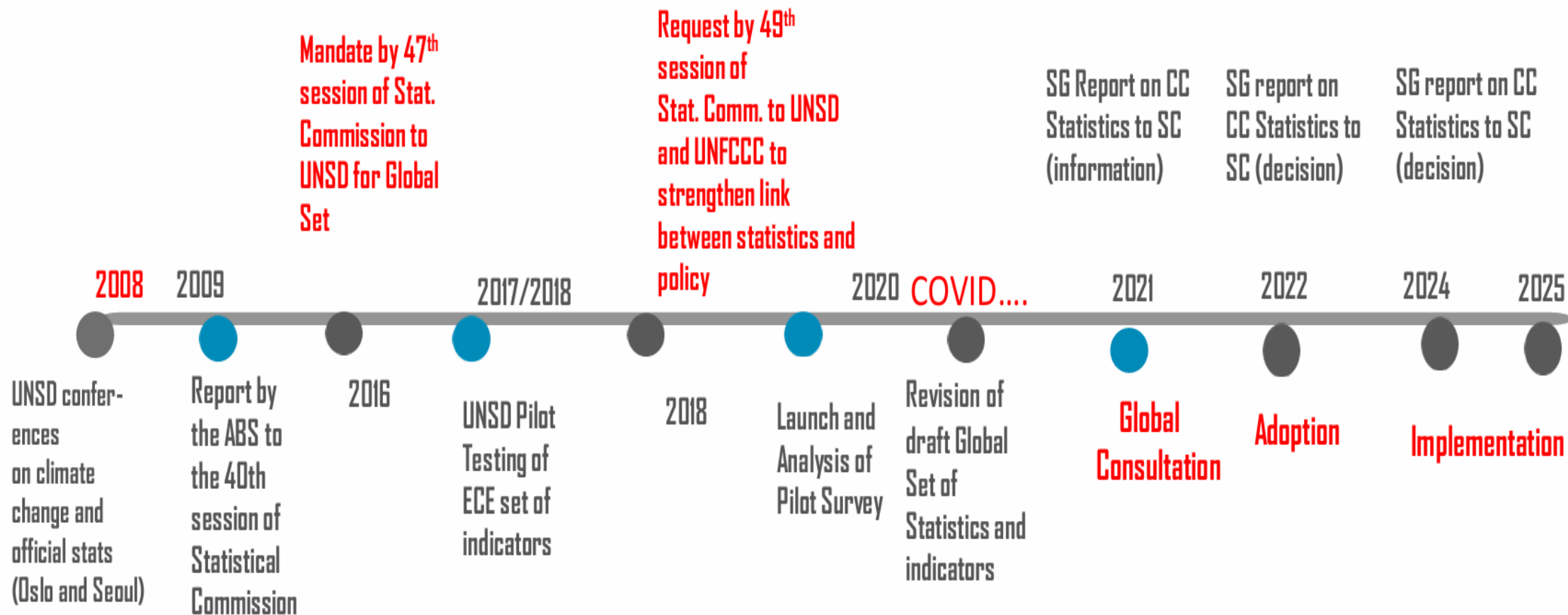
Contents

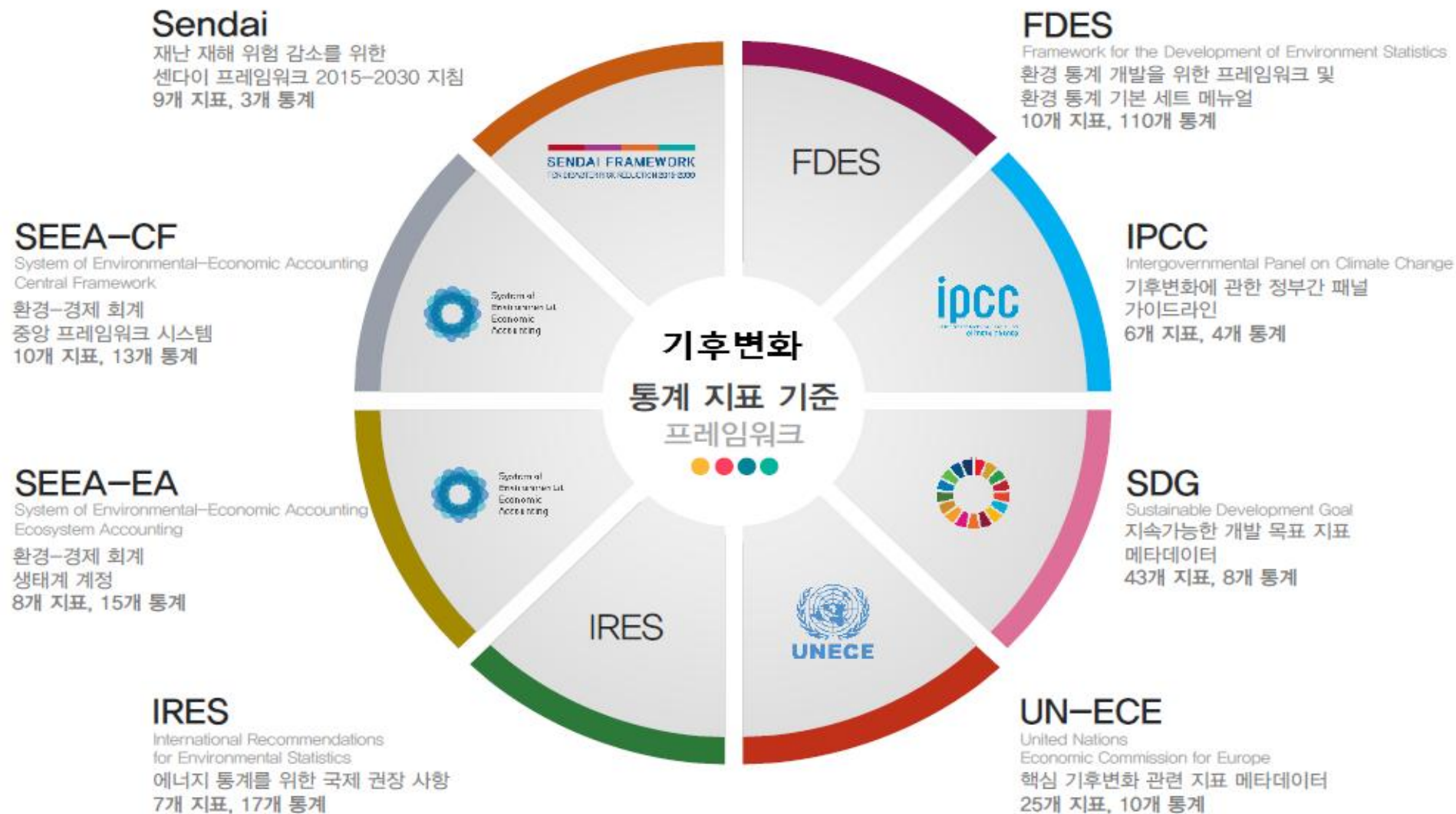
Why Climate Change and Disaster Statistics Matter?

Climate Change and Disaster Data Governance in Korea

How to Apply Global Indicator to National Context

II Development of Global Framework



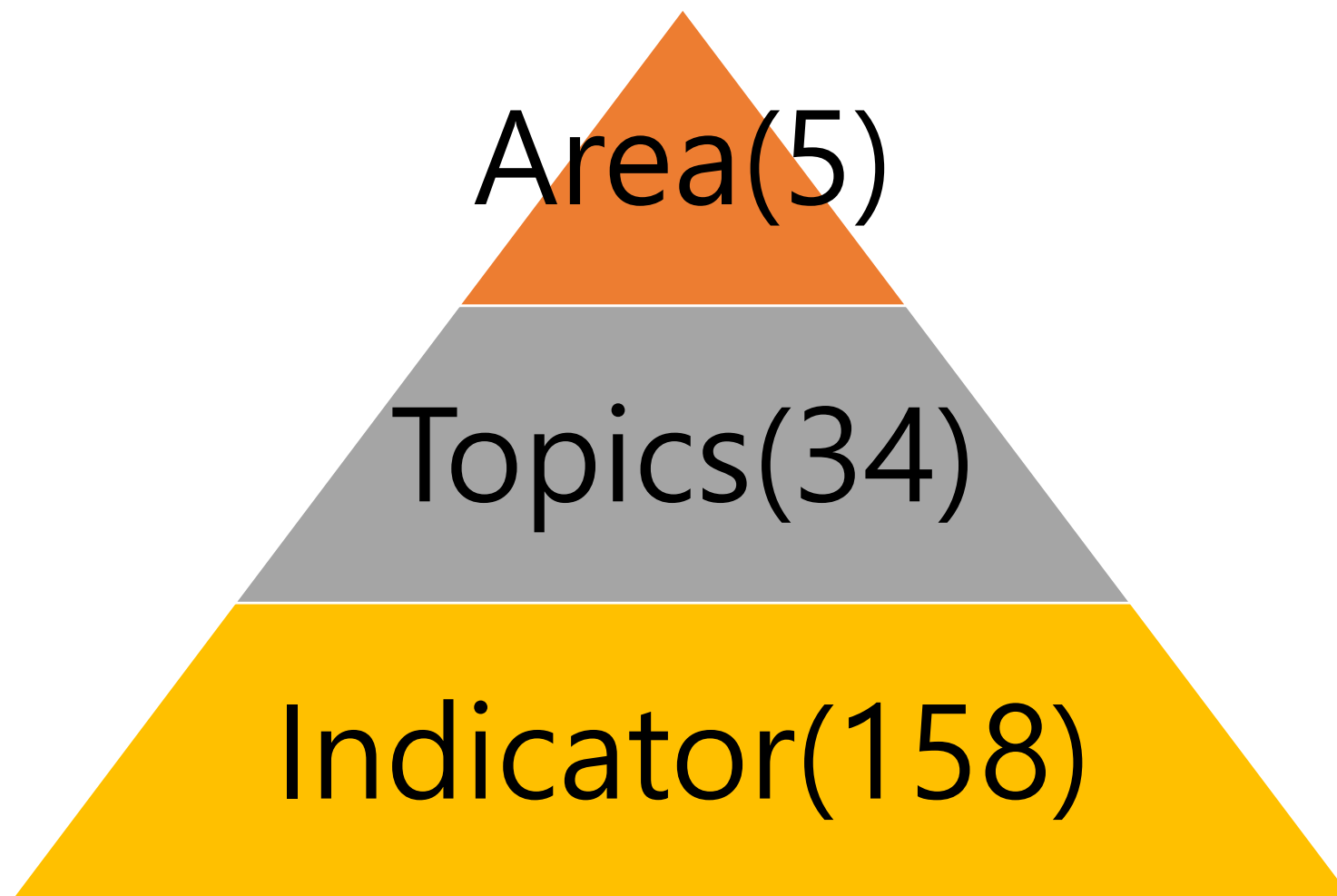


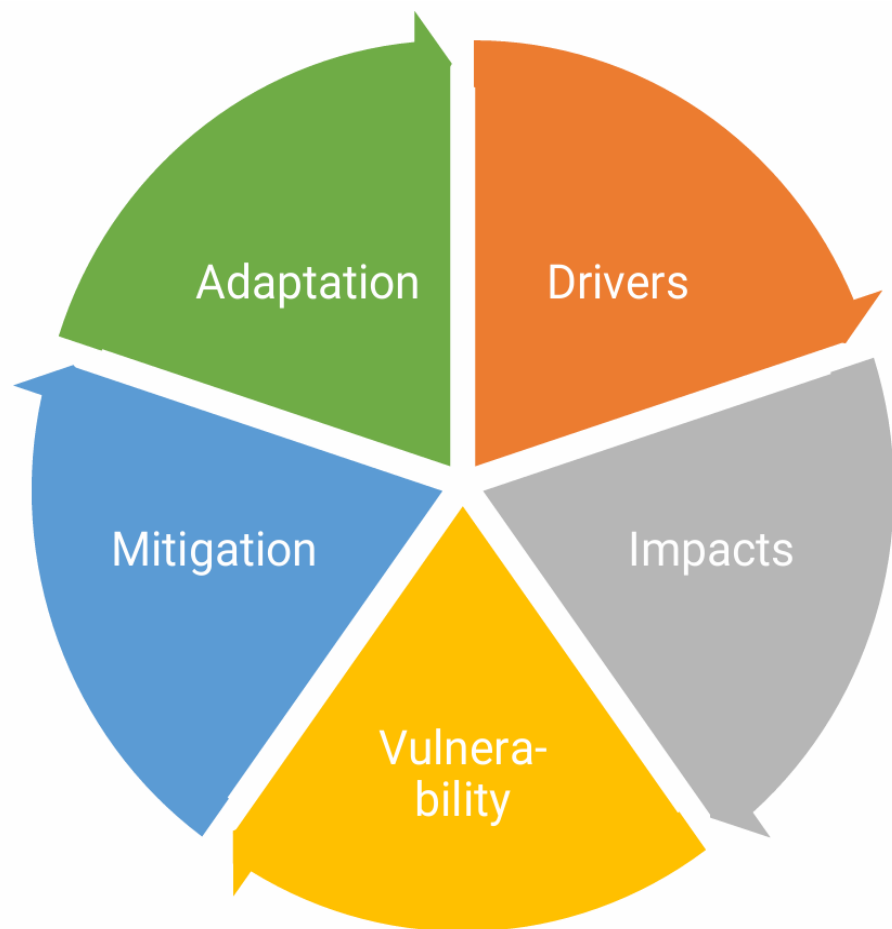
The Sendai Framework

2030 Agenda for Sustainable Development



II Structure of Indicator Framework





The scope of [the Global Set of climate change statistics and indicators](#) covers the climate change aspects defined by the five policy areas of [the Intergovernmental Panel on Climate Change](#), namely drivers, impacts, vulnerability, mitigation and adaptation.

The links between policy and statistics are articulated according to the relevant articles of the [Paris Agreement](#) and the decisions of the Conference of the Parties serving as the Meeting of the Parties to the Paris Agreement, as well as related [Sustainable Development Goal](#) and [Sendai Framework](#) indicators.

- Total GHG emissions
- Atmospheric concentration of GHGs
- Energy production, supply and consumption
- Fossil fuels
- Population
- Transport
- Land and agriculture

Drivers

Impacts

- Agricultural production affected by climate change
- Areas affected by climate change
- Freshwater resources
- Hazardous events and disasters
- Climate change and human health
- Climate change evidence
- Soil condition
- Distribution and status of species
- Distribution and status of ecosystems
- Production and consumption of materials
- Climate change impacts on transport and critical infrastructure
- Climate change impacts on tourism.

Vulnerability

- Water security, food security and agriculture
- Vulnerable species, ecosystems and their services
- Buildings and infrastructure vulnerable to climate change
- Vulnerable population
- Area of country vulnerable to climate change.

Mitigation

- Renewable energy
- Climate change mitigation policies, strategies and plans
- Climate change mitigation technology and practice.

Adaptation

- Climate change adaptation policies, strategies and plans
- Risk management, disaster forecasting and early warning systems
- Public awareness of and education on climate change
- Area-based adaptation to climate change
- Climate change monitoring
- Water management
- Waste management.

II 158 Indicator and 190 Statistics

158 indicators

- serve to support developing and monitoring of national climate policies and international reporting requirements, in particular those under the Paris Agreement

190 statistics

- provide less complex options for countries with less developed statistical systems to initiate climate monitoring through official statistics
- provide statistics needed to compile the indicators (for Tier 1 and 2)
- provide inputs to further define and develop the Tier 3 indicators

Example : Impacts-Hazarous events and disasters

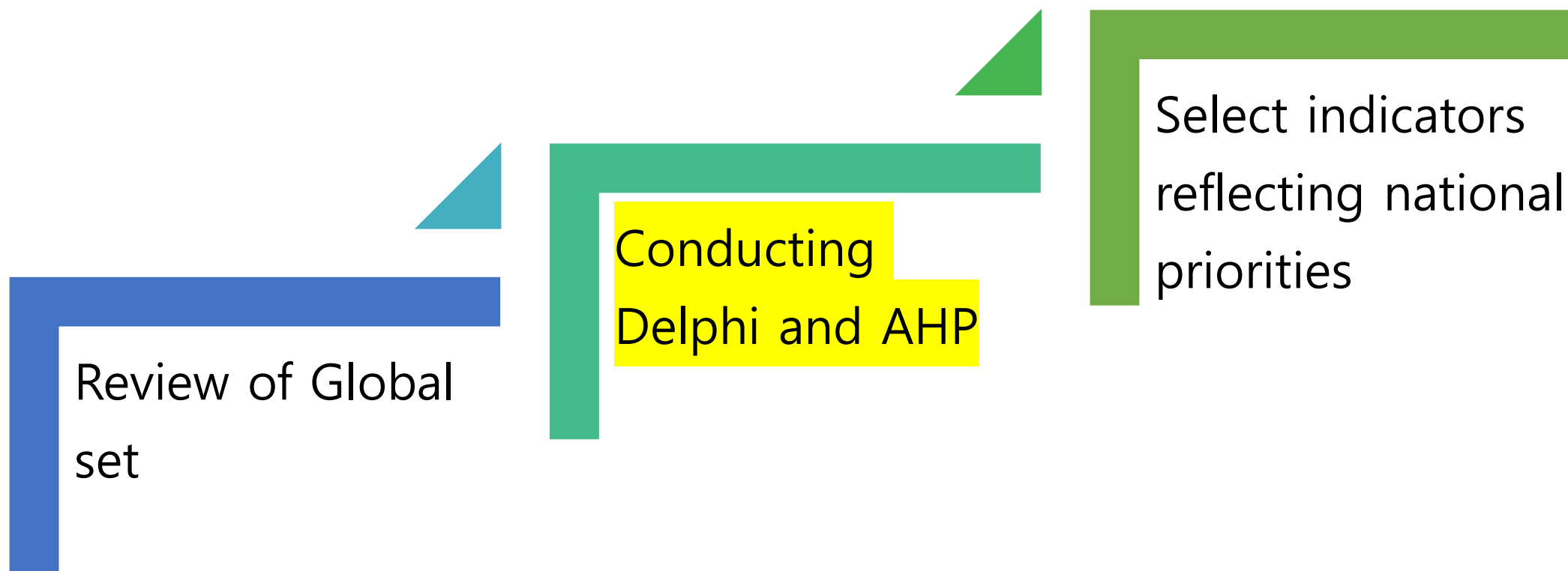
Area/ topic	Indicator	Statistic	Tier	Paris Agreement	Paris Agreement work programme-Katowice package	Method
Impacts						
Hazardous events and disasters						
	39. Frequency of hazardous events and disasters		2	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	
		Occurrence of hazardous events and disasters	2	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	FDES 2013
		Occurrence of extremes of temperatures and precipitation	1	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	ECE
	40. Direct economic loss to all other damaged or destroyed productive assets attributed to disasters		2	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	Sendai; SDG; FDES 2013
	41. Direct economic loss in the housing sector attributed to disasters		2	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	Sendai; SDG; FDES 2013
	42. Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population		1	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	Sendai; SDG; FDES 2013; ECE
	43. Number of climate refugees, climate migrants and persons displaced by climate change		3	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	
		Number of people whose destroyed dwellings were attributed to hydro- meteorological disasters	2	7; 13.8	Decision 18/CMA.1, chap. IV; Decision 9/CMA.1	ECE; Sendai; FDES 2013

Contents

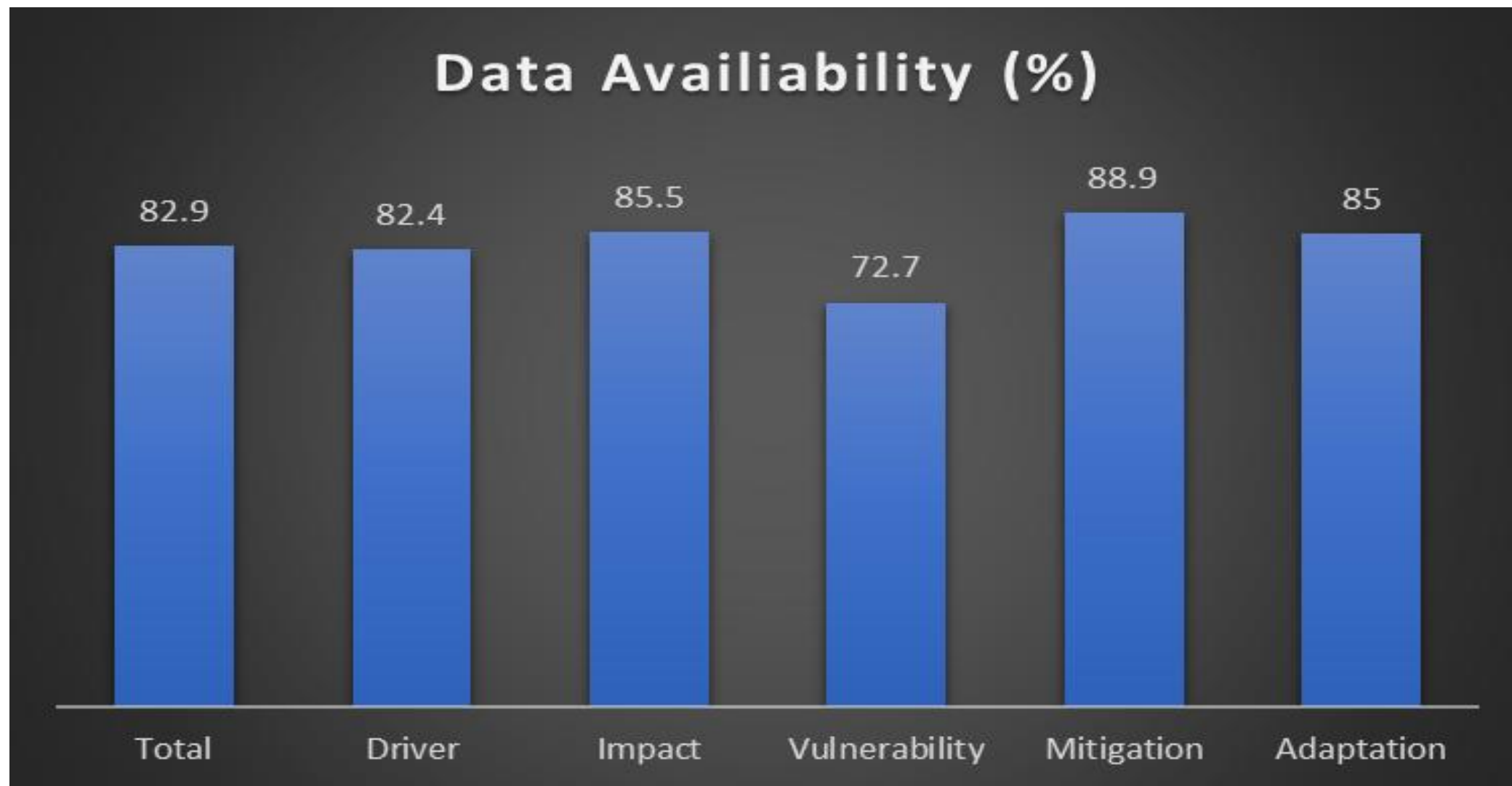
Why Climate Change Statistics Matter?

Climate change data governance in Korea

How to apply global indicator to national Context



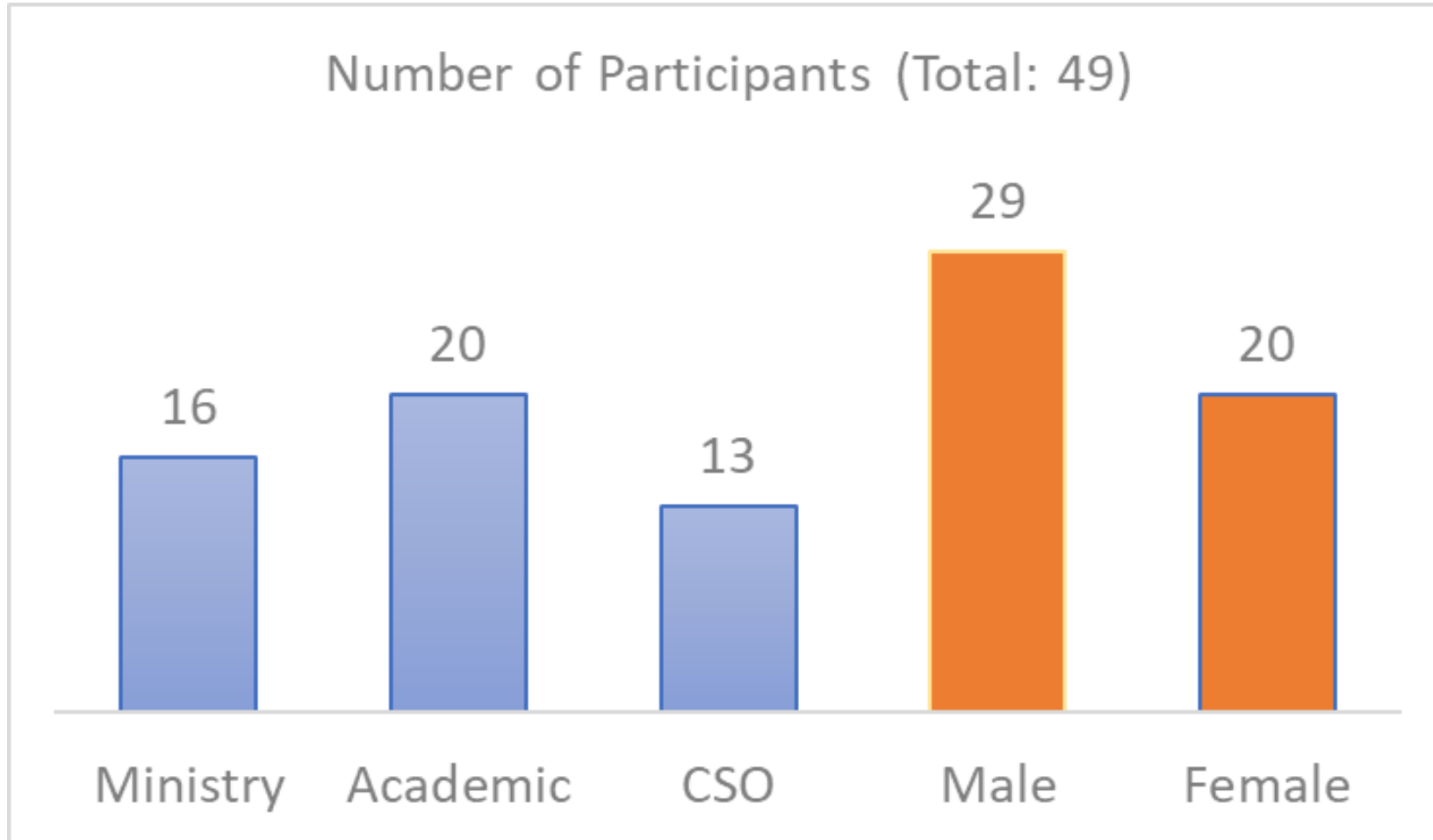
* AHP : Analytic Hierarchy Process



Delphi	AHP (Analytic Hierarchy Process)
April 11 ~ April 17, 2025	May 16 ~ May 26, 2025
Email survey based on paper questionnaire	Email survey using AHP package
1) To what extent do you think the topic is relevant to that area? 2) To what extent do you think the indicator is relevant to the Korean Context? 3) Additional indicator suggestion	1) To what extent do you think the [## area] is important relative to the [## area]? 2) To what extent do you think the [## topic] is important relative to the [## topic]? 3) To what extent do you think the [## indicator] is important relative to the [## indicator]?
4 Point Scale	9 Point Scale
Content Validity Ratio	Consistency Ratio & Composite Priority



Targeting Participants



Original

Agricultural production affected by climate change

Areas affected by climate change

Freshwater resources

Hazardous events and disasters

Climate change and human health

Climate change evidence

Soil condition

Distribution and status of species

Distribution and status of ecosystems

Production and consumption of materials

Climate change impacts on transport and critical infrastructure

Climate change impacts on tourism

Delphi

Agricultural production affected by climate change

Hazardous events and disasters

Areas affected by climate change

Distribution and status of species

Climate change and human health

Distribution and status of ecosystems

Freshwater resources

Climate change evidence

Climate change impacts on transport and critical infrastructure

Production and consumption of materials

Soil condition

Climate change impacts on tourism

AHP

Hazardous events and disasters

Distribution and status of ecosystems

Areas affected by climate change

Distribution and status of species

Climate change and human health

Freshwater resources

Agricultural production affected by climate change

Climate change evidence

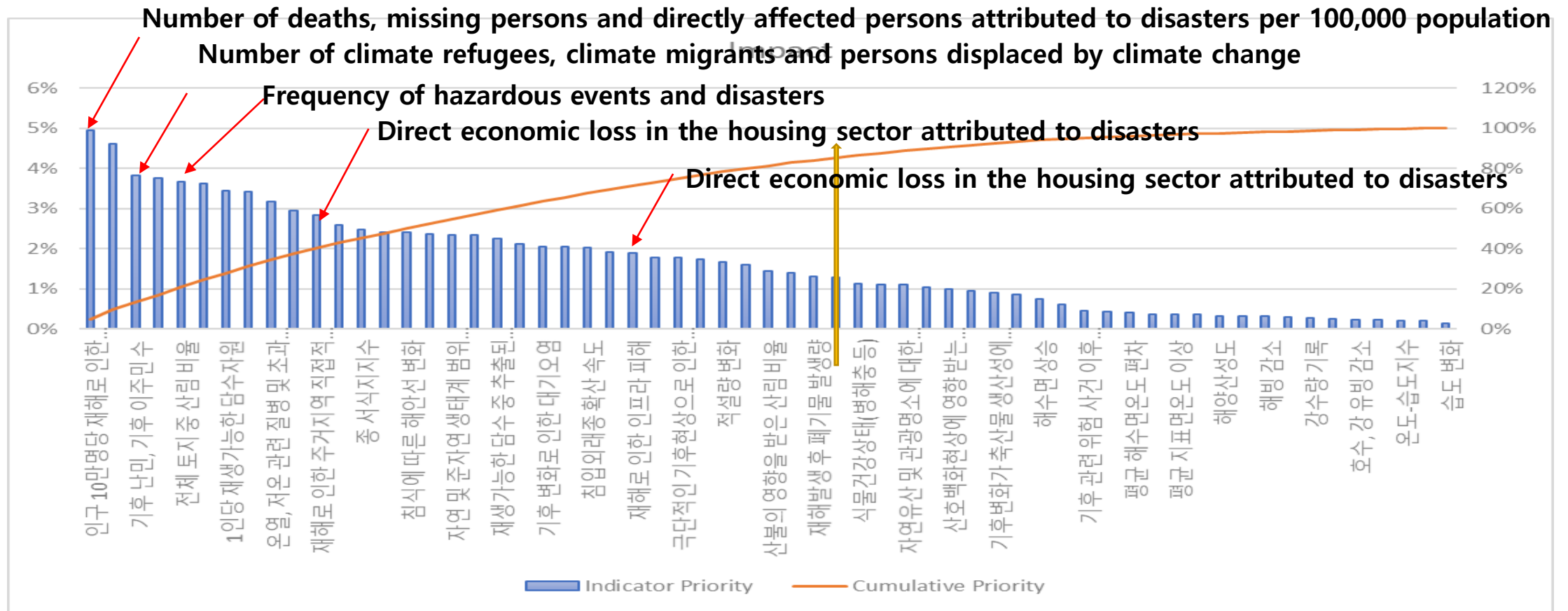
Climate change impacts on transport and critical infrastructure

Soil condition

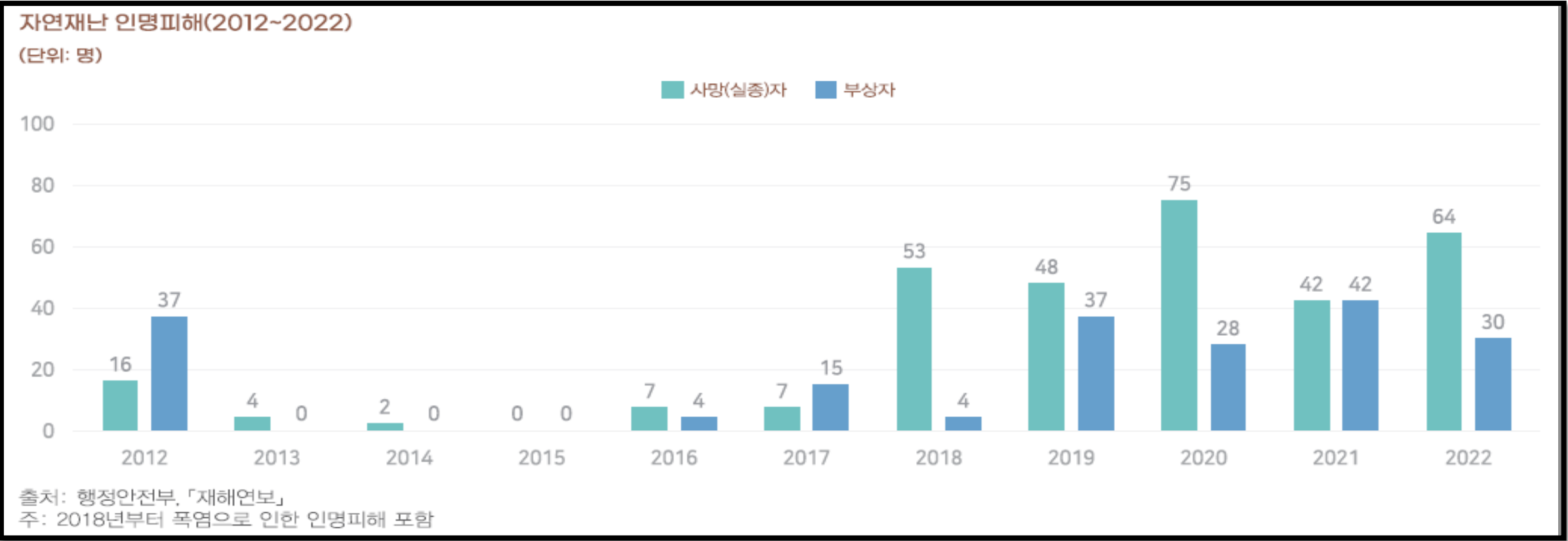
Production and consumption of materials

Climate change impacts on tourism

Main Results_ Indicators under the Impacts Area



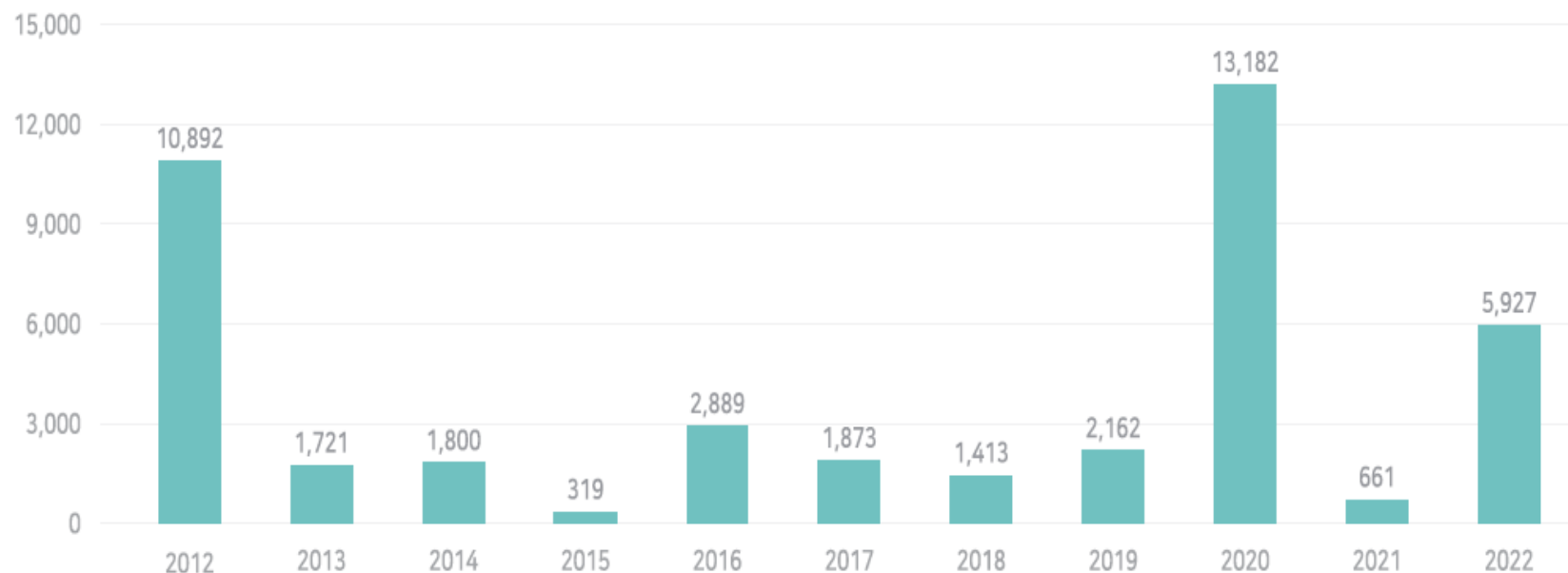
Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population



Direct economic loss to damaged or destroyed productive assets attributed to disasters

자연재난 피해액(2012~2022)

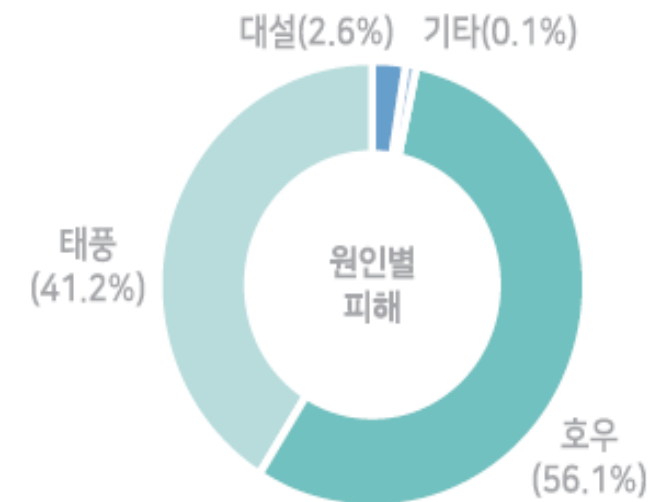
(단위: 억원)



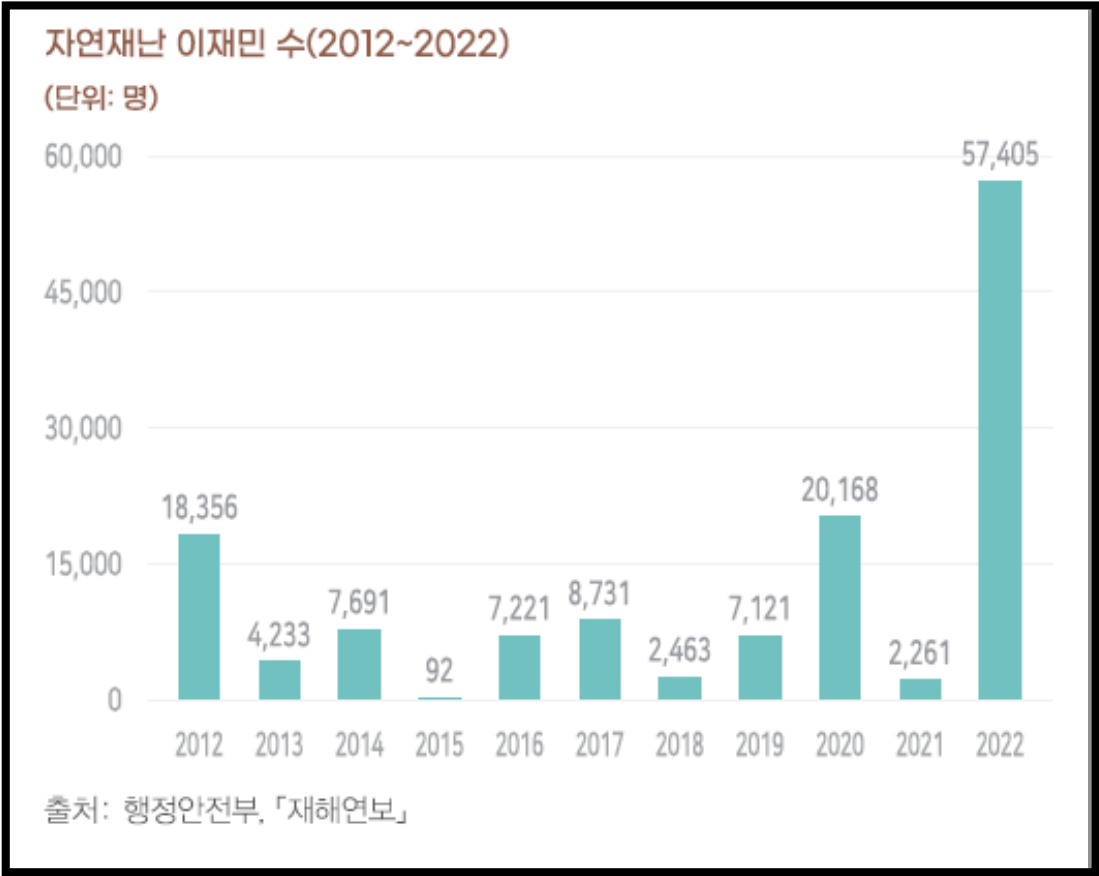
출처: 행정안전부, 「재해연보」

자연재난 원인별·종목별 피해액 구성비(2022)

(단위: %)



Number of climate refugees, climate migrants and persons displaced by climate change



- **Enhancing coordination** among relevant ministries and agencies for integrated climate data production
- **Improving data availability** and consistency to fill existing gaps across climate domains
- **Strengthening policy linkages** between statistical findings and climate adaptation or mitigation strategies
- **Developing evidence-based indicators** reflecting Korea's specific climate and policy priorities

THANK YOU

Youngshil Park
(youngshil@korea.kr
youngshilpark@gmail.com)