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RESEARCH ON THE DEVELOPMENT OF STATISTICAL DATA AND INFORMATION PLATFORMS  
FOR RESPONDING TO THE CLIMATE CRISIS IN SOUTH KOREA

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**Abstract**

*As the severity of climate change continues to escalate, the importance of robust statistical data for its scientific interpretation and analysis becomes paramount. In 2022, the United Nations Statistics Division (UNSD) published the "Global Set of Climate Change Statistics and Indicators" during the 53rd session of the Statistical Commission. While South Korea already produces numerous climate change-related statistics, challenges persist in managing integrated information and avoiding redundancy. To address this, the South Korean government, through Statistics Korea, is conducting research to align national statistics and indicators with international standards.*

*The National Institute of Green Technology (NIGT), under the Ministry of Science and ICT, is a government-funded research institute dedicated to South Korea's climate change policy. NIGT collaborates with the Statistics Korea Statistics Research Institute to develop climate change statistics and indicators, focusing on the UNSD's criteria for 'Drivers,' 'Impacts,' 'Vulnerability,' 'Mitigation,' and 'Adaptation.' This collaboration aims to enable South Korea to produce internationally compliant statistics.*

*In addition, NIGT, in partnership with the Ministry of Environment and the National Institute of Environmental Research (NIER), is systematically building climate change-related statistical data. This research focuses on creating a statistical data environment to identify and predict risks in South Korea's major disaster areas. The data will be based on the Korean Adaptation Information Taxonomy (KAD-Taxonomy) proposed by NIER and will prioritize elements such as importance and urgency. NIGT, together with NIER, plans to publish a statistical data book in the field of climate crisis adaptation in Korea, which will serve as a foundational resource for the nation's major climate crisis response. Furthermore, NIER plans to establish the National Integrated Climate Crisis Adaptation Information Platform, to provide a system supporting policy decision-making based on the statistical data integrated by NIGT.*

**I. INTENSIFICATION OF THE CLIMATE CRISIS**

1. The rise in global temperatures and the increasing frequency of natural disasters due to climate change have become a common worldwide issue. Extreme weather events are occurring more frequently and with greater intensity, underscoring the need for effective responses. Scientific evidence clearly attributes these changes to human activities (IPCC, 2023).
2. In May 2024, extensive flooding in southern Brazil displaced approximately 150,000 people. The Sahel region of Africa experienced extreme heat in April 2024, with temperatures in Mali reaching 48.5°C, leading to increased hospitalizations and deaths. East Africa faced five consecutive failed rainy seasons from 2020 to 2022,

resulting in the worst drought in 40 years and the displacement of 1.2 million people in Somalia. Canada recorded its worst wildfire season in 2023 (BBC, 2024).

3. In South Korea, the average annual temperature over the past 30 years (1991-2020) has increased by about 1.6°C compared to the previous 30-year period (1912-1940), outpacing the global average temperature rise of 1.09°C. The country has experienced significant climate-related damages, including heavy rainfall, floods, droughts, typhoons, and heatwaves, resulting in 254 casualties and economic losses of approximately 3.6 trillion KRW (about 2.7 billion USD) over the past decade (2012-2021) (The Government of the Republic of Korea, 2023).

## II. CURRENT POLICY RESPONSES OF SOUTH KOREA

4. South Korea is implementing a range of policies to address the climate change crisis. The "Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis" enacted in September 2021, aims to reduce greenhouse gas emissions and respond to climate change. Based on this legislation, the government has developed national strategies and master plans.

5. Since 2008, South Korea has been formulating national plans for climate change adaptation. Currently, adaptation policies are being executed based on legal frameworks at both national and local government levels. Key examples of these efforts include "The 3rd National Climate Change Adaptation Plan (2021-2025)" and "The Enhanced 3rd National Climate Crisis Adaptation Plan (2023-2025)".

6. The Enhanced 3rd National Climate Crisis Adaptation Plan aims to provide a preemptive and comprehensive response to climate change. This plan focuses on minimizing the damage from the climate crisis and strengthening adaptive capacity across society and the economy. To achieve this, the government plans to establish a comprehensive platform for systematically collecting, analyzing, and providing climate crisis adaptation information. This platform will create a standard classification system and enhance data-based policy support.

7. Furthermore, South Korean government departments and local authorities are collaborating to develop and implement climate change adaptation plans. Each local government is developing its own climate crisis adaptation plans in accordance with the "Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis", promoting responses tailored to regional characteristics. These plans contribute to reducing climate crisis damage, enhancing adaptive capacity, and raising overall awareness of climate change.

8. These efforts are crucial in reducing the damage caused by climate change and pursuing sustainable development. South Korea aims to respond more effectively to the climate crisis and provide a safe and healthy environment for future generations. The comprehensive approach, combining national legislation, strategic planning, and local implementation, demonstrates South Korea's commitment to addressing the complex challenges posed by climate change.

## III. CLIMATE CHANGE STATISTICS AND INDICATORS

9. The Climate Change Statistics and Indicators Self-Assessment Tool (CISAT), developed by the United Nations Statistics Division (UNSD), is designed to assist countries in systematically evaluating their climate change statistics and indicators. In 2022, the UN Statistical Commission adopted CISAT, encouraging member states to utilize it in preparing their national climate change statistics and indicators. CISAT supports countries in adopting a systematic and balanced approach to developing and reporting climate change statistics and indicators, based on a Global Set that includes 158 indicators and 190 statistics. This tool is intended to assist each country in selecting and prioritizing relevant statistics according to their national priorities and needs (UNSD, 2023a). The CISAT was developed with reference to the UNECE's Conference of European Statisticians set of core climate change-related indicators, as well as statistics, indicators, and methodologies from the Framework for the Development of Environment Statistics (FDES), Sustainable Development Goals (SDG), and the Sendai Framework (UNSD, 2023b).

10. South Korea recognizes the urgent need to establish comprehensive statistical indicators that align with international standards to facilitate the effective implementation of carbon neutrality policies. The international community demands reports based on reliable statistics, emphasizing the construction of scientific and rational national statistical indicators as an essential element for data-driven carbon neutrality and climate change response policies. To ensure the effectiveness of new national climate change statistical indicators, comprehensive research is essential to analyze international standards, assess domestic conditions, and develop strategies for creating and maintaining statistical indicators. This research should involve experts from related fields and utilize analyses of previous studies. Additionally, when diagnosing current statistical indicators and domestic conditions, it is critical to identify areas requiring improvement, prioritize them, and create a strategic roadmap. This approach will aid in designing a national climate change statistical indicator system and operational framework that considers domestic policy support, promotion, information provision, and international cooperation methods for efficient implementation and performance dissemination.

11. The National Institute of Green Technology (NIGT) is a research institution dedicated to South Korea's climate change policies. NIGT is collaborating with the Statistics Korea Statistics Research Institute (SRI) to conduct research on climate change statistics and indicators. This research focuses on the statistical and indicator criteria in the areas of 'Drivers', 'Impacts', 'Vulnerability', 'Mitigation' and 'Adaptation' as outlined by the UN Statistical Division. The objective is to enable South Korea to produce statistics that meet international standards in the future.

#### **IV. ESTABLISHMENT OF CLIMATE CRISIS ADAPTATION INFORMATION STATISTICAL DATA**

12. South Korea is establishing legal and institutional foundations to address the climate change crisis and is developing a climate crisis adaptation information system based on quantitative data to support policy-making. Providing scientific evidence and strengthening decision-making support for climate crisis response requires the establishment of accurate and reliable adaptation statistical data. It is essential that the statistical data constructed for climate crisis response align with global standards and facilitate international comparison.

13. According to previous research, a review of international statistical indicators based on the UNSD CISAT standards revealed that only about 28% of South Korea's nationally approved statistics in the field of climate crisis adaptation are applicable to international standards. This percentage is the lowest among the five climate areas (causes, impacts, vulnerability, mitigation, and adaptation) (Statistics Korea Statistics Research Institute, 2023). Consequently, there is an urgent need for South Korea to collect statistical data in the adaptation field.

14. Recently, South Korea has been developing plans to construct scientific and quantitative adaptation information statistics and methods to collect, process, and provide this data to effectively respond to the climate crisis. This action plan includes developing a standard classification system for adaptation information that considers climate risks for South Korea's climate crisis adaptation, collecting dispersed adaptation statistical data within the country, and deriving methods to comprehensively manage adaptation statistical data through the development of an information platform. These plans have been formulated based on national strategies, and related policies and research activities are currently being pursued.

15. The National Institute of Green Technology (NIGT) is systematically constructing climate change-related statistical data in collaboration with the Ministry of Environment and the National Institute of Environmental Research (NIER). These organizations are conducting research to collect and produce statistical data in the adaptation field to respond to South Korea's climate crisis. Through these efforts, NIGT aims to create a statistical data environment that can identify and predict detailed risks in South Korea's major disaster areas due to climate change.

16. The climate crisis statistical data will be constructed in stages based on the Korean Adaptation Information Classification System (KAD-Taxonomy) proposed by NIER, prioritizing factors such as importance and urgency. KAD-Taxonomy is an information classification system created considering South Korea's climate risks, and

related research is ongoing. The statistical data collection process will focus on key keywords of adaptation information and will include the creation of a complete data list and meta-information. This statistical data collection will be designed to align with relevant global standards.

17. The statistical data collection process will begin by establishing priorities by considering the importance and urgency of each type of climate crisis in South Korea, and then proceed with data collection in stages according to the determined priorities. To determine priorities, research methods such as literature review, Delphi, and AHP will be employed. The collected statistical data will be processed or analyzed as needed, categorized, stored, and utilized.

18. In the future, NIGT, in collaboration with NIER, plans to publish a statistical data book in the field of climate crisis adaptation in South Korea, which will serve as a foundation for the country's major climate crisis response. Furthermore, NIER aims to develop a national integrated climate crisis adaptation information platform to provide a policy decision support system based on South Korea's climate crisis adaptation statistical data.

## **V. CLIMATE CRISIS RESPONSE PLAN BASED ON INFORMATION PLATFORMS**

19. The international community emphasizes the importance of climate change adaptation information and is working to systematically manage and share this information. Specifically, the UNFCCC encourages countries to regularly submit and update their climate change adaptation plans, priorities, and support needs. The United States provides adaptation information through the Climate Change Adaptation Resource Center (ARC-X) information platform and climate resilience toolkit. Europe operates a climate risk and adaptation database and the Climate-ADAPT information platform. Japan has enacted the National Climate Change Adaptation Act and provides relevant information through the Climate Change Adaptation Information Platform (A-PLAT).

20. In response, South Korea is implementing various policies and institutions to effectively address climate change. The country is establishing legal and institutional foundations to respond to the climate change crisis and is developing a climate crisis adaptation information system based on quantitative data to support policy-making. Based on the "Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis" enacted in September 2021, South Korea is formulating national strategies and master plans. Since 2008, the country has been developing national plans for climate change adaptation. Currently, adaptation plans are being implemented at both national and local government levels in accordance with the law.

21. South Korea is developing and operating various information platforms to respond to climate change. The government is providing integrated policy presentations for carbon neutrality and various information for greenhouse gas reduction. Furthermore, the National Institute of Green Technology (NIGT) has developed and operates the Climate Technology Information System (CTis) to provide integrated information for climate change response through technology. NIGT is currently developing a data archive based on CTis to collect climate change-related data comprehensively for use in national policies and research. Moreover, NIGT is developing a carbon-neutral international cooperation strategy map information platform that can support decision-making for South Korea's climate technology international cooperation policies and projects based on big data and artificial intelligence.

22. In addition, the Ministry of Environment and the National Institute of Environmental Research (NIER) of South Korea have recently established the KAD-Taxonomy for climate crisis adaptation information and are collecting statistical data. They aim to develop and implement a comprehensive platform for climate crisis adaptation information from 2025 to 2028. Through this, South Korea aims to provide unified information on the climate crisis and support policies based on statistical data. These efforts are considered important steps towards minimizing the damage caused by climate change and promoting sustainable development.

## VI. CONCLUSIONS

23. The global rise in temperature and the increasing frequency of natural disasters due to climate change have emerged as worldwide concerns. South Korea is experiencing severe natural disasters and climate anomalies as a result of these changes. Consequently, various natural disasters such as heatwaves, droughts, and floods are occurring more frequently, leading to an increase in human casualties and economic losses.

24. The South Korean government is implementing diverse policy measures to address this climate change crisis. The "Framework Act on Carbon Neutrality and Green Growth for Coping with Climate Crisis" enacted in September 2021, provides a legal foundation for reducing greenhouse gas emissions and responding to climate change. Based on this legislation, national strategies and master plans are being developed and implemented. This legal and institutional framework enables long-term responses to climate change and promotes more effective policy implementation through collaboration at national and local government levels.

25. The establishment of accurate and reliable climate change statistical data is a crucial element for the success of climate change response policies. The United Nations Statistics Division's CISAT tool is assisting countries in systematically evaluating and improving their climate change statistics and indicators. South Korea is striving to construct comprehensive statistical indicators that align with international standards, thereby strengthening the scientific basis of its climate change response policies.

26. South Korea aims to provide integrated information and policy support through its climate change information platforms. The development of a standard classification system for climate crisis adaptation information and the construction of a comprehensive platform, led by the Ministry of Environment and the National Institute of Environmental Research, are part of these efforts. These platforms provide unified information on climate change, supporting data-driven policy formulation and implementation.

27. By adopting this holistic approach, which combines legislation, statistical data development, and information platforms, South Korea demonstrates its commitment to addressing the complex challenges posed by climate change. These efforts are crucial steps towards minimizing the impacts of climate change and promoting sustainable development for future generations.

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