The 4th Basic Plan for the Promotion of Research Activities in Antarctica of the Republic of Korea (2022-2026)

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***Background***

The government of the Republic of Korea has established the “Basic Plan for the Promotion of Research Activities in Antarctica” (hereinafter referred to as the “Antarctic Plan”) every five years since 2007. The Antarctic Plan was established pursuant to the “Act on Antarctic Activities and Antarctic Environmental Protection” (hereinafter referred to as the “Antarctic Act”) enacted in 2004. The aim of the Antarctic Plan is to promote research activities in the Antarctic and the Southern Ocean to contribute to the development of science and technology that would help our understanding of Earth systems.

The Antarctic Plan is a comprehensive and detailed five-year action plan expressing the Korean government’s vision and strategy to foster research activities in Antarctica, including setting goals for scientific research, contributing to environmental protection, and nurturing experts in Antarctic research. The 4th Basic Plan for the Promotion of Research Activities in Antarctica is in effect from 2022 to 2026.

***Vision and Goals***

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| Vision | To become one of the leading countries in Antarctic research |
| Goals | Carrying out critical and emerging Antarctic research  Building competencies to respond to emerging global issues  Laying the groundwork for practicing leadership in Antarctic governance |
| Strategy 1  Developing core competencies for critical Antarctic research | (a) Promoting inland Antarctic research  (b) Facilitating the development and application of technologies for practical usage  (c) Developing convergence technologies for exploration |
| Strategy 2  Enhancing contribution to respond to global issues | (a) Building competencies to respond to climate change  (b) Expanding comprehensive research on the environment and ecology for the protection of the Antarctic region |
| Strategy 3  Strengthening Korea’s role in Antarctic governance | (a) Leading international cooperation efforts  (b) Establishing a joint research platform for the industry, academia, and research institutions  (c) Nurturing future researchers by implementing education and outreach programs |

Table 1 – Visions and Goals of the 4th Basic Plan for the Promotion of Research Activities in Antarctica

The 4th Antarctic Plan lays out the Korean government’s core Antarctic goals; carrying out future-driven Antarctic research, building competencies to respond to emerging global issues, and laying the groundwork for expanding contributions in Antarctic governance. To achieve these vision and goals, the government formulated three strategies to enhance scientific research activities in Antarctica; developing core competencies for research, enhancing contributions to respond to pressing issues, and strengthening Korea’s role in Antarctic governance.

For the purpose of enhancing the Korean contribution to scientific research activities in the inland Antarctica, the government has identified the following priority areas; (1) expanding research in Antarctic inland, (2) developing exploration technology to support research, (3) observing and predicting climate and environmental change, and (4) conserving the Antarctic and Southern Ocean environment and ecosystem.

In addition, the government considers the following two issues essential for building competencies in Antarctic research: international cooperation for the purpose of enhancing scientific research and the establishment of a platform for joint research between industry, academia, and research institutions.

* Strategy 1: Developing core competencies for critical Antarctic research

1. For the purpose of increasing Korea’s contribution to scientific research in Antarctica, the government has formulated a strategy to reconstruct past climate conditions and predict future changes through deep ice core and blue ice, and to establish a research camp with mobile research facilities, ultimately aiming to establish the third research station in inland Antarctica to enable improved astronomical and space observation and glacial research.
2. Another research goal under this strategy is to analyse flora and fauna which have adapted to extreme conditions, in order to develop cold-resistant crops, new bio-materials, and pharmaceuticals that can contribute to solving the problems faced by humanity. An additional research goal is to make use of Antarctic environmental conditions characterized by low temperatures and ice for chemical studies in order to develop eco-friendly purification technology and methods to synthesize new materials.
3. The government plans to draw the subglacial topography of Antarctica (BEDMAP) and use Korean satellites to acquire spatial data to support inland research. Managing observation equipment and collecting data are currently done manually, but unmanned vehicles and communication technologies are being developed to automate the process. These technologies minimize human activities and the associated human footprint and reduce risk to researchers.

* Strategy 2: Enhancing contributions to respond to global issues

1. The Korean scientific community plans to stimulate research in Antarctica that aims to enhance Korea’s contribution to responding to global challenges such as climate change and environmental conservation. Reconstructing past climate changes through research on deep ice coring and glacial seabed coring in the Southern Ocean will increase the accuracy of future climate predictions. These predictions, coupled together with observation efforts, will help us understand the extent to which global environmental change impacts the Southern Ocean and its atmosphere, and the role of the Antarctic climate in the global climate system, including sea level rise caused by melting of Antarctic glaciers and ice sheets.
2. The Korean government plans to expand scientific research that contributes to the protection of the Antarctic environment and ecosystem, expand research on pollution and human impact monitoring in the Antarctic Specially Protected Areas (ASPA), and increase research in the Ross Sea Marine Protected Area (MPA), so that the Republic of Korea can fulfil its obligation to the Antarctic Treaty System (ATS). In addition, the government will develop a long-term observation system in order to enable prediction of future ecosystem changes in Antarctic flora and fauna, including terrestrial and marine organisms.

* Strategy 3: Strengthening Korea’s role in Antarctic governance

1. The Korean government plans to expand its agenda-setting competencies based on its scientific research achievements in order to strengthen its responsibility and increase its contribution as a Consultative Party of the Antarctic Treaty. For this purpose, Korea will strengthen its activities in the Antarctic Treaty system, and enhance international cooperation to develop international joint research projects in the Southern Ocean.
2. Domestically, the government intends to further promote the shared use of polar research infrastructure and establish a platform that would reproduce Antarctic environment for research purposes to enhance collaboration across research institutions, universities, and industry. In addition, the government plans to establish and operate an integrated polar information system to collect and manage the data obtained through observation in the polar regions and create a unified repository to enhance data accessibility and utilization.
3. The government plans to create Antarctic Forum to encourage domestic and international discussion concerning the Antarctic. The forum will encompass a conference where experts of the Antarctic environment can discuss policy recommendations, an international symposium where researchers will present their latest results, and an outreach event that will connect the scientific community and members of the public who are interested in Antarctica. There will be continued efforts towards a postgraduate program specializing in polar sciences, and an outreach campaign for the conservation of the Antarctic environment.

***Future of the Korean Antarctic Research Activities***

The Republic of Korea plans to initiate full-scale research activities on the Antarctic continent centered on its research infrastructure; two year-round research stations *(King Sejong and Jang Bogo)*, the icebreaking research vessel *Araon*, and the construction of another icebreaking vessel that will soon begin the first stage of design and its scheduled to be deployed in 2027, and the Korean Antarctic traverse (*K-Route*). Though the Korean Antarctic program currently does not operate research station on the Antarctic inland, the government is developing policy to utilize mobile research facilities for research in the region. The Korean program also plans to increase its contribution to research on the atmosphere, oceans, and glaciers in order to respond to climate and environmental changes, which are considered key issues under the Antarctic Treaty system. In addition, Korea will increase its contribution to the protection of the Antarctic environment by expanding research on the Marine Protected Areas (MPAs) in the Southern Ocean and the Antarctic Specially Protected Areas (ASPAs). Through these activities, the ROK will diligently fulfill its role as a Consultative Party to the ATS and will contribute to addressing global challenges, including climate change.