

Initiative of the International Big Science Research Plan: Three Poles Environment and Climate Change

1. Name of Initiative

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2. Background and Description

The three poles of the Earth—the Antarctic, the Arctic and the Third Pole—drive the energy cycle, water cycle and material transport of the globe. There are abundant fresh water and biological diversity in these areas. They are also important shields of global ecological environment. Studies suggest that the three poles are the most sensitive and vulnerable areas of the Earth and the heating rates of the three poles are 2-3 times of world's average. Even if we aim at the ideal global warming temperature of 1.5 °C at the end of the 21st century set at Paris Climate Change Conference, the abnormal temperature rising of three poles will also lead to serious environmental consequences and significantly change the ecological environment of three poles. For example, the consistently dry and cold Qinghai-Tibet Plateau is getting wet and warm and threatening its ecosystem and biodiversity. Another example is that the intensified melting of ice sheets at Greenland and the southwest of the North Pole has contributed to a rapid rise in sea levels in recent years. Moreover, the Arctic warming has led to permafrost degradation, which has further resulted in the release of large quantities of greenhouse gases including methane.

At present, the global scientific community increasingly attaches importance to researches of the three poles. However, the priority is still given to respective studies on the three areas and there is a lack of researches on the comparison, correlation and interaction mechanism among the environment and climate change of the three poles, which is an important factor in the accurate prediction of future climate change by the current earth climate system model.

It is increasingly recognized by international scientists that the study of the three poles as a whole is a key point for re-examining the issues of global change and has great significance. First, it may break through the bottleneck of traditional research and provide new evidence and new direction for global change research. Second, it will provide scientific support for economic development planning and policy formulation of the Qinghai-Tibetan Plateau, the Arctic and countries and regions affected by the three poles and will prevent major environmental risks and protect the well-being of the indigenous people. Third, it will effectively enhance the depth and breadth of international scientific and technological cooperation, draw global public attention to the three poles, and contribute to the building of a community of shared future for mankind.

3. Overview of Initiative

The Initiative of the International Big Science Research Plan: Three Poles Environment and Climate Change aims to promote scientific and technological innovation and

cooperation among various sectors of the international community in the fields of the three poles environment and climate change and the impact and adaptation, including:

A. To promote the establishment of an overall design and institutional environment for three pole collaborative research

(1) To launch the International Big Science Research Plan of Three Poles Environment and Climate Change, to establish the international scientific committee of three poles based on the existing scientific cooperation dialogue mechanism, and to complete the top-level design of the Plan and improve the basic theoretical system;

(2) To study the institutional and environmental requirements for promoting the implementation of three poles international collaborative research, and to promote the establishment of a long-term mechanism for the implementation, evaluation and maintenance of three poles collaborative research programs.

B. To Establish and improve the scientific and technological support for the study of the three poles environment and climate change

(1) To appeal to relevant countries to increase research and development investment in three poles research;

(2) To jointly build and share the infrastructure and space-based observation system in the three poles;

(3) To strengthen, integrate and continuously advance the three poles collaborative observation, and promote the acquisition and sharing of three poles observation data;

(4) To promote cooperation in the establishment of a three poles environment and climate change prediction system, to strengthen research on the environment and climate change and its socio-economic impact on the three poles region, and to achieve sustainable development in the three poles region as well as other parts of the world affected by the three poles.

C. To Strengthen international scientific and technological cooperation in the study of three poles environment and climate change

(1) To coordinate international cooperation in three poles science, in ways of establishing three poles science center and research summit and so on;

(2) To encourage and support indigenous people to participate in the assessment and definition of three poles research priorities, and enhance the ability of indigenous communities to adapt to three poles changes.

(3) To build an international exchange and cooperation platform by holding international forum and constructive dialogues, to share and exchange practical experience of three poles research, and to strengthen the connection to various stakeholders with their needs.

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