



# Citizen Science Approach to Climate Change Adaptation

The purpose of this study is to explore ways to utilize citizen science as a means to promote citizen participation and fill gaps in adaptation knowledge to improve adaptive capacity to climate change and enhance the effectiveness of adaptation policies. Ten years have passed since the national climate change adaptation policy was fully implemented, and the importance of science-based adaptation, citizen participation and governance was emphasized. However, there was a lack of an approach or program that combines the two issues. In particular, the indicators and methods for evaluating the improvement of citizens' adaptive capacity, which is an important goal of the policy, are insufficient.

Scientific knowledge and the role of experts are important for effective adaptation. However, due to the nature of adaptation issues, scientific knowledge alone is not sufficient to reduce risks. Therefore, a bottom-up approach has been emphasized in which stakeholders participate in the adaptation process to coordinate and integrate various sources of knowledge and perspectives. In this respect, citizen science characterized by 'voluntary citizen participation', 'scientific characteristics' and 'openness' is a useful approach for realizing adaptation policy goals.

As a result of a survey of citizens who participated in the six heatwave citizen monitoring projects, positive changes in the adaptation

awareness, capacity and behavior after participation in the project showed indirectly the potential of citizen science. On the other hand, according to expert evaluation, the gap in adaptation knowledge and information is large, and the gap between at the national level and the local level is also large. Experts saw that citizen science would contribute to filling the adaptation knowledge gap, and its effectiveness was evaluated as higher than cost. In particular, at the local level, the utility of citizen science was high enough to offset the cost in all areas.

Based on the results of the analysis, the following are the ways to use citizen science to adapt to climate change. First, it is necessary to analyze the current state of adaptation knowledge gap, identify the priorities and opportunities for citizen science, and develop the strategy to mainstream citizen science in adaptation policies.

Second, by linking citizen science and indicators for developing, implementing and evaluating adaptation policies, the effectiveness of citizen science-produced data and knowledge is enhanced.

Third, various citizen science programs are designed according to the citizen's capacity, participation level, and adaptation goals.

Fourth, it is suggested to build a citizen science platform that provides adaptation knowledge sharing and intermediary services and connects citizen science-related activities, and to expand investment in capacity building infrastructure such as toolkit development.

Fifth, support for adaptation R&D specialized in citizen science, establishment of local citizen science governance and the pilot projects for community-based adaptation are important in creating a citizen science ecosystem.

Sixth, it is recommended to increase the educational effect by introducing citizen science to school education programs, green campus, and climate change specialized graduate school projects.

This study is meaningful as the first attempt to explore the applicability of citizen science by finding the interface between climate change adaptation and citizen science. There is a limit to presenting detailed policies because the perception of both citizen science and adaptation is low, and domestic citizen science cases are also very limited. Expert evaluation on the adaptation knowledge gap and effectiveness of citizen science needs to be supplemented through further research. And in order to measure the effect of citizen science on the improvement of adaptive capacity, it should be considered in the project design stage. In addition, the contribution of citizen science to enhancing adaptive capacity should be evaluated through the pilot project in the future, and the possibility of linking the citizen science and the digital and green new deal as a means of innovation for citizen participation in solving the climate crisis would be examined.

**Key Word**

citizen science, climate change adaptation, citizen participation, adaptation knowledge gap, scientific risk management