

Applicability of Nature based Solutions Technology and Policies to reduce climate vulnerability in Forest Ecosystem

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1. Introduction

- The impact of climate change is increasing in cities, such as frequent natural disasters in urban areas due to climate change, resulting in a rapid increase in human and property damage.
- Recently, ecosystem-based resilience, such as eco-resilience, is being discussed, and discussions on the need for Ecosystem-based Adaptation(EbA) to increase resilience for climate change adaptation are actively being discussed.
- In addition, climate change adaptation policies and technologies based on ecosystems are needed to restore and maintain functions of ecosystems damaged by various causes.
- Ecosystem-based Adaptation policies and technologies are needed from a long-term perspective for sustainable development.
- The purpose of this study is ①to investigate domestic and foreign Ecosystem-based Adaptation cases and ②to find ways to introduce them as climate change adaptation measures.

2. Method

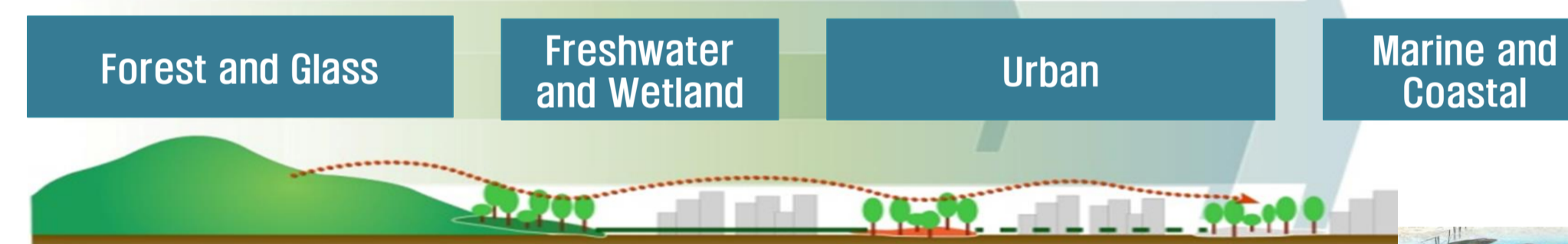
- The scope of this study focuses on Ecosystem-based Adaptation. Concepts similar to EbA includes ecosystem-based management and ecosystem-based approach. And according to the IUCN French Committee(2019, p.9), there is a nature-based solution as a higher level concept. However, since the purpose of this study is to examine the possibility of introducing climate change adaptation measures, papers and reports with only the keywords of ‘ecosystem-based adaptation in Korean’ and ‘ecosystem-based adaptation in English’ are set as the research scope.
- The research method of this study is as follows. Defining the term of Ecosystem-based Adaptation through case analysis, and reviewing the possibility of introducing it as a climate change adaptation measure compared to National climate change Adaptation Plans(NAP).

3. Results

□ Definition of Ecosystem-based Adaptation

Reduce the impact of climate change by using ecosystems, establish mutually complementary relationships for the social and economic sustainability of local communities and sustainable ecosystems, and protect and manage them.

□ Examples of Ecosystem-based Adaptation Measures



- Forest restoration through reforestation and slope greening
- Increased carbon capture through restoration of alpine ecosystems
- Development of community-based carbon capture technology
- Redesign of waterways to prevent forest disasters such as landslides
- Climate resilient grazing and livestock management
- Reconstruction and restoration of grazing land
- Improvement of agricultural ecosystem and farming system

- Improving the surrounding environment, such as reforestation and restoration of the riverside
- Watershed restoration
- Wetland protection and restoration
- Integrated water resources management plan at watershed level

- Creation of urban green spaces by creating urban forests, planting 30 million trees, and creating street trees
- Introduction of ecological elements of urban space, such as rooftop greening and permeable paving, vegetable gardens, and ecological ponds
- Apply multi-layered mixed planting
- Establishment of a regional-wide network of green spaces
- Designation of flood risk management area
- Development of spillage reduction facilities and rainwater harvesting technology

- Stabilization of coastal dunes and beaches
- Composition of artificial reefs acting as breakwaters
- Induce and manage the retreat of the coastline through the relocation of the breakwater
- Creation of space for development of intertidal habitats such as tidal flats and salt marshes

4. Discussions and Conclusion

- In this study, the term was defined through an analysis of cases of Ecosystem-based Adaptation, and countermeasures that could be applied domestically were investigated.
- Through case studies, this study defines Ecosystem-based Adaptation as ‘using the ecosystem to reduce the impact of climate change, build a mutually complementary relationship for the social and economic sustainability of the local community and a sustainable ecosystem, and protect and manage it’.
- Suggested EbA measures that can be applied to forest and grassland ecosystems, freshwater and wetland ecosystems, marine and coastal ecosystems, and urban ecosystems by synthesizing domestic and international cases, and investigated measures that can be applied to local communities and related institutions did.
- Based on these results, the possibility of being introduced into National climate change Adaptation Plan(NAP) was reviewed, and the introduction direction was presented.
- Partially proposed measures applying the concept of ecosystem-based adaptation to the 2nd and 3rd NAP of Korea, and proposed in relation to local communities.
- EbA, which is currently a concept reflected only in some sectors, can be applied to a wide range in various fields. EbA for freshwater and wetland ecosystems, such as riverside reforestation and restoration, can be applied to the water management sector in NAP.
- Since the actual implementers of NAP are likely to be local governments, it is necessary to adapt and introduce community-based measures, which are characteristic of EbA measures.