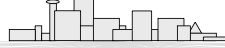


Model of integrated impact and vulnerability evaluation of climate change in South Korea

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2016. 5. 12



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01 Background

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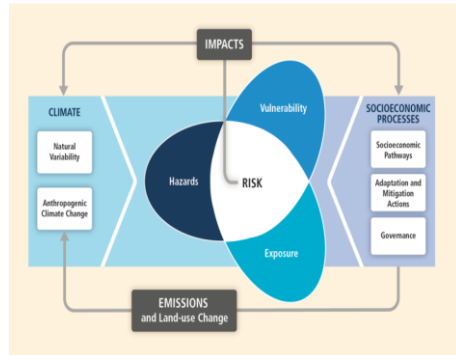
Why Adapt to Climate Change?

- Threats by global warming, sea-level rise, and extreme weather events observed due to climate change (IPCC, 2013)
- Under a business-as-usual scenario approximately 3 °C increase by 2100
 - Expected costs would be approximately 58 Billion USD (min. 2B ~ max.328B) (World Economic Forum, 2007)
- The future risks from climate change will be higher.
- By 2100, benefits of adaptation are expected to overwhelm those of mitigation
 - Net marginal benefits of Korea's adaptation estimated to be approximately 39.7 Billion USD between 2021 and 2030 (KEI, 2011).

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Need for Integrated Assessment Models

- “Climate change involves complex interactions and changing likelihoods of diverse impacts.” (IPCC AR5, 2014)
- Until now, research on climate change impact and vulnerability assessment has mainly focused on individual sector model
- As climate change affects all sectors with diverse impacts, cross-sectoral linkage (and integrated) impacts and vulnerability assessment are necessary to establish appropriate adaptation plans.
 - Support policy design via prioritization, prevention of mal-adaptation, and quantitative assessment



(IPCC AR5, 2014)

- Effective adaptation plans must be based on scientific research that shows future risks of climate change.

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Introduction of the R&D Project

- Title**
 - Development of Integrated Model for Climate Change Impact and Vulnerability Assessment
 - “Model of InTegrated Impacts and Vulnerability Evaluation of climate change” (MOTIVE)
- Funder**
 - Ministry of Environment
 - Korea Environmental Industry and Technology Institute (KEITI)
- Project Period**
 - 2014.5.1 ~ 2021.4.30 (7 Years)
- Resources**
 - Budget: Approximately 21 Million USD (7 years)
 - 100+ Experts from the Interdisciplinary Research Group of:
 - Korea Environment Institute, Seoul National University, Korea University, and National Institute of Ecology

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02 Research Plans

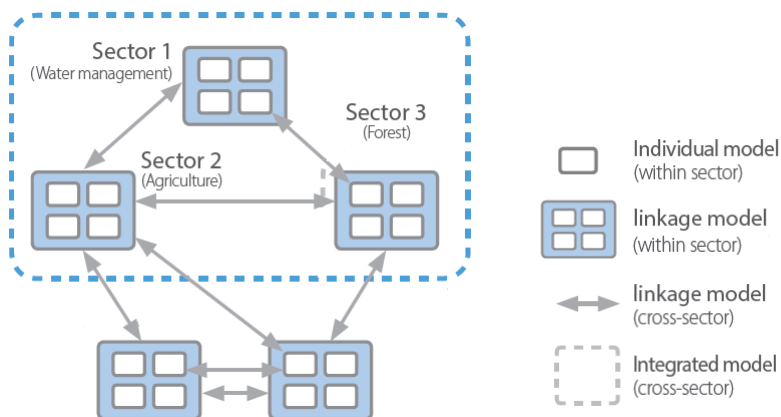
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Ultimate Goal

- Developing integrated assessment model that fully reflects Korean circumstance, which can be utilized for designing science-based adaptation strategies
 - Establish realistic and effective adaptation plans based on cross-sectoral climate change impacts and vulnerability assessment
 - Invent methodologies for outlining risk-centric strategies for the national-level adaptation
- Sectors: Health, Agriculture, Forestry, Ecosystem, Ocean/fishery, and Water resources
 (where all sectors partially include disaster components)

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Structure of Integrated Assessment Model Development



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Subjects of Sub-Modules

Sectors	Major Target for Assessment
Ocean/Fishery	Sea-level rise, ocean circulation/temperature/salinity
Health	Heat wave, air pollution, water-/vector-borne infectious diseases
Water	Water quantity/quality and aquatic ecology
Forest	Species distribution, forest growth/carbon cycle, landslide/fire/pest
Agriculture	Crop productivity, farmland carbon cycle, pest
Ecosystem	Alien species, endangered species, habitat

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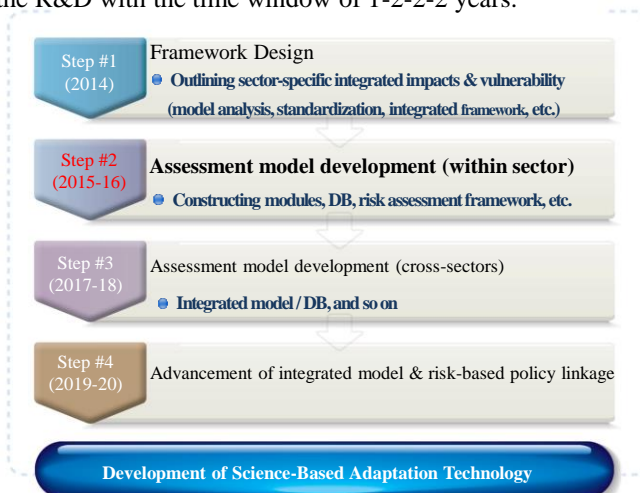
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03 Implementation Strategies

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Step-By-Step Implementation

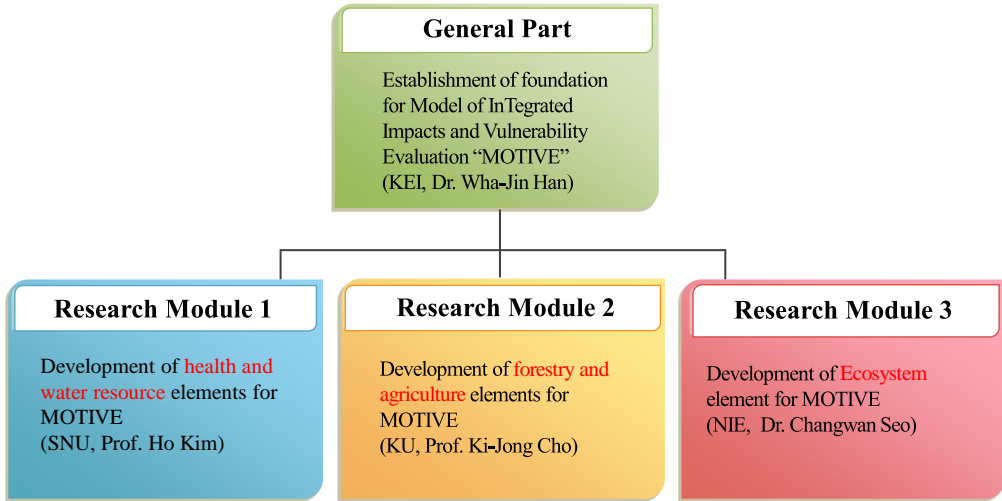
- Managing the R&D with the time window of 1-2-2-2 years.



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Implementation System and Role Allocation 한국환경정책·평가연구원 Korea Environment Institute

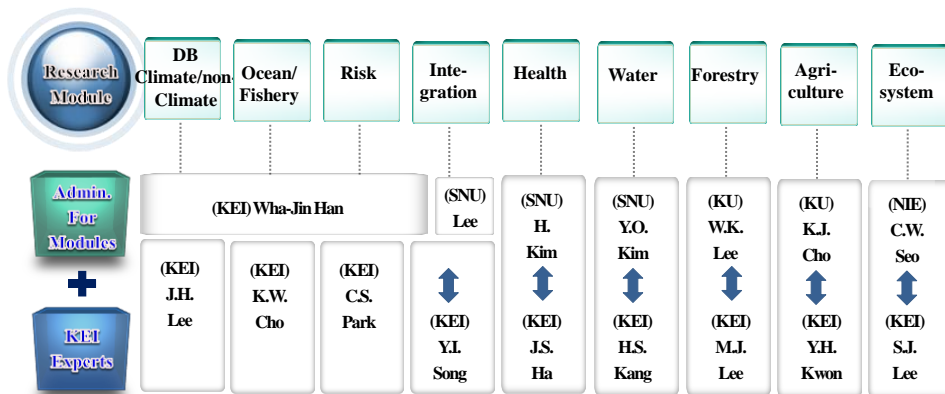


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- Participating institutions and experts appointed based on their fields of expertise



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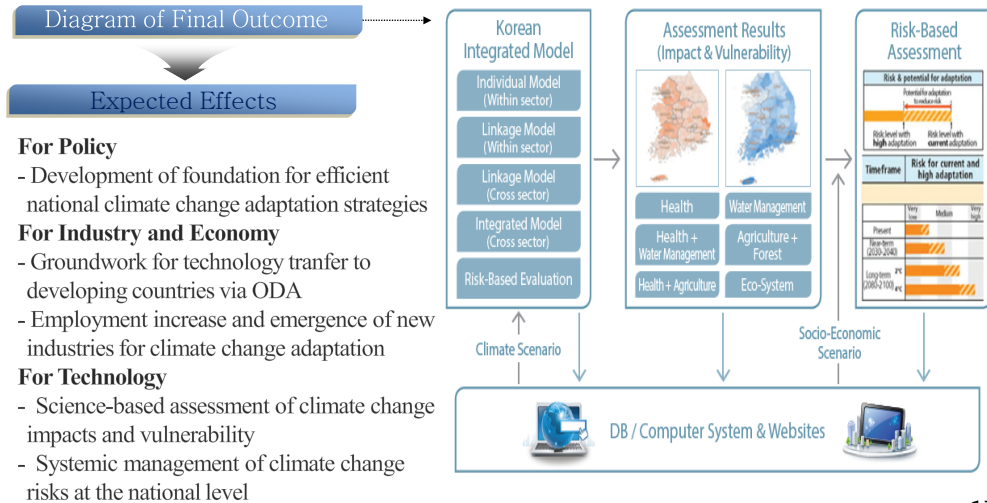
04 Expected Outcomes and Effects

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Expected Outcomes and Effects

- Detailed model and DB of climate/non-climate spatio-temporal information
- Module of sectoral impact and vulnerability assessment
- Cross-sectoral assessment model of impact and vulnerability
- Integrated model of climate change impact and vulnerability assessment for objective policies and plans
- Development and applications of risk predictive methodology

Expected Outcomes and Effects



Summary

- Developing ‘MOTIVE’ will be very difficult, but very challenging work
- The 1st yr (2014), we tried to figure out the research direction, particularly on the model development that fully reflects Korean circumstance.
- But, our study could not yet embody linkage model and integrated model. the present study(2015) is a step to improve the existing individual model for developing linkage and integrated model
- Although we are in Step II(2015-2016), understanding preceding model development from different research teams is significant.
- So, sharing experience and lessons from Climsave in Europe, NEXUS in Japan, etc must be taken into consideration to develop the MOTIVE, with improving individual model in our study.

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Thank You Very Much!

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