

Social Technologies to Support Implementation of Climate Change Adaptation Technologies at Local Communities in Japan

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1. Introduction

In response to recent national and international situation on climate change adaptation such as “National Plan for Adaptation to the Impacts of Climate Change” and the Paris Agreement, local adaptation strategies have been begun to examine at local governments eventually in Japan. The results of future climate projection and impact assessment have been provided in various realm and their accuracy have been improved greatly in a series of national research projects. Social Implementation Program on Climate Change Adaptation Technology (SI-CAT) of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) put high priority on utilizing climatic technologies in local governments for their policymaking. The authors are in charge of social implementation of the climatic technologies via social technologies such as risk communication, consensus building and so on.

2. Methodology

We have taken the following methodologies in SI-CAT. i) Clarifying potential needs of nationwide local governments for formulating adaptation strategies via questionnaire and interviews with local officials of environmental departments mainly. ii) Clarifying potential needs of nationwide stakeholders via online deliberation experiments. iii) Supporting development of application software on climatic technologies and preparing risk communication manual. iv) Developing narrative scenarios for future adaptive community by integrating scientific knowledge and local knowledge in some areas. v) Setting up a series of co-design workshops to match needs of local governments and seeds of climatic technologies. The paper introduce a part of results of i) and v) briefly as follows.

3. Results

The outline of questionnaire and interviews to local governments is shown in table 1. The main results demonstrate as follows. i) While some prefectures and major cities have already started preparing adaptation strategies, the majority of municipalities is yet to consider such strategies. ii) Key challenges for local governments in preparing adaptation strategies are found to be twofold: the lack of knowledge and experience in the field of climate change adaptation, and compartmentalization of government bureaus. The fact that most of the local governments in Japan are still yet to assess the local impacts of climate change which would lay the groundwork for preparing adaptation strategies suggests that co-design facilitating the circulation that technological seeds wake up needs of local government and the needs deepen the seeds, is important.

We then set up co-design workshop inviting both local governments’ officials and scientists who are developing climatic technologies to match their needs and seeds. The workshop was held in the afternoon of August 31st, 2016 and the participants were 76 people including secretariat. The participants were divided into five groups in which consisted of both scientists and local officials. The participants discussed “What is the technology development effective for policymaking of adaptation strategies”. The output was summarized in structural drawing within a poster paper for each group by the facilitator on the day. Later, they were visualized in a form of network graph by text mining and network analysis based on the minutes so that the participants get to understand the gap and common ground among them.

4. Further works

We also have conducted online deliberation experiments to clarify potential needs of nationwide stakeholders, conduct a questionnaire to the public to support developing application software on climatic technologies and preparing risk communication manual, and conducted stakeholder analysis to develop narrative scenario for future adaptive community in some areas. We plan to further interviews with local officials in each department of disaster prevention, agriculture, and health, develop narrative scenario for adaptive community and set up co-design workshop for the second time.

Keywords: local government, questionnaire, risk perception, expert knowledge, co-design, visualization

Table 1 Outline of the Questionnaire and Interview to Local Governments

	Paper-based Surveys of Major Local Governments	Interview Survey of Model Prefectures
Survey Period	February–March 2016	January–February 2016
Participants	Environmental policy divisions at 155 local governments throughout Japan, including prefectures (except for the 6 prefectures mentioned to the left), major cities with the designations of <i>seirei-shitei-to</i> , <i>chūkaku-shi</i> , and <i>shikōjitokurei-shi</i> , and cities where prefectural headquarters are located.	Bureaus for the environment, agriculture, disaster prevention, etc. of Ibaraki (coastal areas, agriculture), Gifu (environment) and Saga (environment) Prefectures ("model" prefectures participating in MEXT's Social Implementation Program on Climate Change Adaptation Technology project).
Method	Surveys distributed and collected by regular mails (When requested, an electronic file was distributed and collected by e-mail).	After approximately 2 hours of lecture and discussion, participants later completed the survey in the electronic file format and returned it via e-mail
Responses	123 (79.4%)	Heat (1), coastal areas (2), agriculture (1), all domains (28)
Survey items	—	1) Perceived policy-related external force risks, vulnerabilities, and outcomes to be prevented; 5) adaptation technology in the form of information and tools which aid in policymaking; 7) stakeholders.
	—	2) Climate change impact appearance status, future potential of occurrence, impact severity, countermeasure urgency, policy status, and the need for tools and information for projections on future impacts; 3) the status of investigations and developing of adaptation plans; 4) problems related to investigating and promoting adaptation strategies; 6) support expected for the investigation, promotion and social implementation of adaptation strategies; 8) Other (free response).