



## **Social Experiments in Tokyo Metropolitan Area Convection Study for Extreme Weather Resilient Cities(TOMACS)**

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### Introduction

TOMACS research project has been started since 2010 July in order to develop the elementary technologies which are required for the adaptation of societies to future global warming impacts that cannot be avoided by the reduction of greenhouse gases. In collaboration with related government institutions, local governments, private companies, and residents, more than 25 organizations and over 100 people are participated.

TOMACS consists of the following three research themes:

Theme 1: Studies on extreme weather with dense meteorological observations

Theme 2: Development of the extreme weather early detection and prediction system

Theme 3: Social experiments on extreme weather resilient cities

Theme 1 aims to understand the initiation, development, and dissipation processes of convective precipitation in order to clarify the mechanism of localized heavy rainfall which are potential causes of flooding and landslides.

Theme 2 aims to establish the monitoring and prediction system of extreme phenomena which can process real-time data from dense meteorological observation networks, advanced X-band radar network systems and predict localized heavy rainfalls and strong winds.

Through social experiments, theme 3 aims to establish a method to use information obtained by the monitoring system of extreme phenomena to disaster prevention operations in order to prevent disasters and reduce damage.

### Social Experiments

Toyo University is the core university for the social experiments accomplishment. And following organizations are participating in this research theme: NIED, the Tokyo Metropolitan Research Institute for Environmental Protection (TMRIEP), University of Tokyo, Tokyo Fire Department (TFD), Edogawa Ward in Tokyo, Yokohama City, Fujisawa City and Minamiashigara City in Kanagawa, East Japan Railway Company, Central Japan Railway Company, Obayashi Corporation, and Certified and Accredited Meteorologists of Japan(CAMJ).

The social experiments have carried out [U+3000] in four different disaster prevention disciplines, i.e. rescue services, risk managements, infrastructure, and life and education as follows;

(1) Rescue Service, conducted by TDF

(2) Risk Managements, conducted by Edogawa Ward of Tokyo, Yokohama City, Fujisawa City, and Minami-Ashigara City

(3) Infrastructures, conducted by East Japan Railway Company, Central Japan Railway Company, and Obayashi Corporation.

(4) Life and Education, conducted by Toyo University, University of Tokyo, TMRIEP, and CAMJ

Each participant has different purposes. For example, the main objective of the social experiment at Edogawa ward is to provide easy-to-understand information of heavy rain to the local residents. Tokyo Fire Department set up the dedicated website and have been used as an early information collection tools during a localized heavy rain and inland flood damages. East Japan Railway Company and Central Japan Railway Company have studied to be used as additional information for managing the safe operation of the railway. Obayashi Corporation have taken an advantage of the information to ensure the safety of the construction site and

so on.

In the paper, overview of TOMACS and some of social experiments results are presented and difficulties of social experiments will be discussed as well.