

Realization of the early grasp of information on damaged infrastructures in responding to earthquake disasters

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1. Background

When a large-scale earthquake occurs, infrastructure administrators, such as personnel within the regional development bureau, need to promote the response to an earthquake disaster immediately. The contents of the earthquake disaster response change with time from establishment of a system, as well as the dispatch of a liaison and TEC-FORCE, to identification of damaged areas through emergency inspection and emergency repairs, etc., (A in the figure). Consequently, the contents of information required at the scene of an earthquake disaster response, the accuracy required for information, and completeness (how many areas whose information should be grasped are covered), etc., also change (B in the figure).

Although considerations on the development and utilization of various technologies, such as airborne SAR and drone, are advanced as the means to grasp the information on the infrastructures damaged by an earthquake early, it is not clear when and how such technologies work in earthquake responses that change with time.

Based on the above, NILIM has organized the information required for an actual response to the 2016 Kumamoto Earthquake and is promoting the systematization of the technologies for early grasp of information on damaged infrastructures (hereinafter referred to as “systematization”) for clarifying the roles expected of respective technologies as well as target levels such as immediacy, accuracy, and completeness that should be achieved through technological development.

2. Flow and Present State of the Consideration on Systematization

For systematization, the actual conditions of the responses to the Kumamoto Earthquake (A in the figure), as well as when and what kind of information was collected, were organized first. Currently, the information needs (C in the figure) are being clarified by identifying the issues on earthquake responses based on the information obtained each time through the mapping of earthquake responses to the collected information on the time axis.

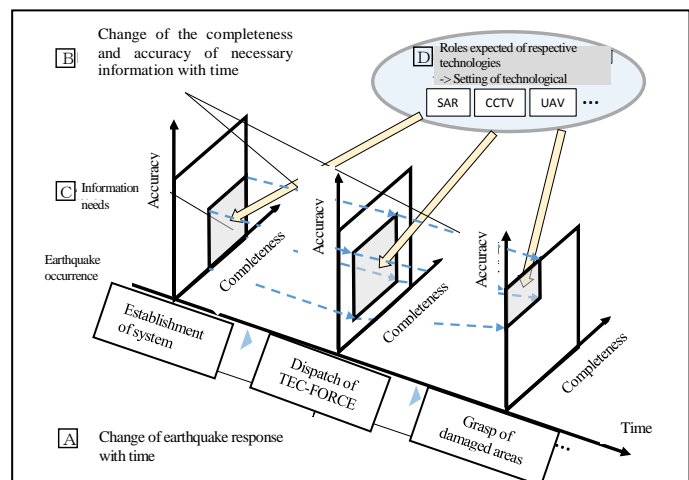


Figure Outline of the Change of Information Needs and the Systematization

In this process, the necessity of technologies that can resolve situations, such as where the collection of information is affected by the disconnection of CCTV cameras set up near a facility and by restriction of nighttime flights of helicopters has been highlighted. In addition, in parallel with the clarification of needs, the characteristics of the grasp of information by various technologies for grasping information on damaged infrastructures early are currently organized through interviews with development institutes from the viewpoints of immediacy, accuracy, and completeness, etc. In the future, the information needs obtained will be compared with the characteristics of respective technologies to clarify the roles of respective technologies as well as target levels (D in the figure).

3. Availability of Systematization and Future Efforts

In the past, only what information was collected by the developed technologies was organized later as the consequence when a disaster occurred. However, by performing considerations according to the flows described in 2, it will be possible to set development goals after comparing the actual abilities of technologies with the information needs at the scene of an earthquake response. In the future, we are planning to promote efforts to build an information provision system aimed at supporting earthquake responses accurately based on the clarified information needs, as well as to expand the scope of systematization in a cross-sectional and disaster manner as the disaster prevention and reduction research promotion headquarters.