

# Development of technologies to renovate facilities to ensure the health and safety of evacuees at evacuation shelters

(Study period: FY 2017–2019)

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## 1. Introduction

Methods to improve the living environment in evacuation shelters need to be developed to prevent mental and health problems and to ensure the safety of evacuees after they experience a massive earthquake followed by a prolonged stay in evacuation shelters. When evacuation shelters are to be installed, individual situations, such as regional characteristics, need to be taken into consideration. Yet, current evacuation shelter guidelines do not necessarily provide sufficient information concerning specific ways to construct and renovate evacuation shelters.

Research and development to counteract this issue has been continuing since FY 2017. This article introduces the outline of the study, the contents to be examined this fiscal year, the direction of drafting a manual to protect health and safety in evacuation shelters, and future prospects.

## 2. Outline of the study

The purpose of this study is to show specific methods and renovation technologies to provide acceptable toilet and sanitary environments, privacy, and performances related to noise, temperature, and light as the living environment at evacuation shelters.

Three levels of target standards for the living environment, a level that is similar to daily life, a level that is about the same as past evacuation shelters, and a minimum level that will at least prevent serious health problems were organized using the gathered information about technologies for disaster response facilities by taking into consideration the availability of facilities at schools, which are often used as evacuation shelters, as well as the advantages and disadvantages of individual

facilities. The study also organized precautions related to capacity, cost, and operation of individual facilities needed to provide shelter functions to satisfy the applicable standards. In organizing the data, the time schedule for the infrastructure and external support are set as shown in Figure 1. The study also considered the range of locations, such as schools, which are used as shelters as shown in Figure 2.

## 3. Future prospects

The findings will be organized to prepare a draft of a manual for protecting health and safety at evacuation shelters. The draft of the manual will be prepared so that it will become useful by conducting hearings with the officials assigned to evacuation shelters by the local governments. The draft will be released on the website and other media.

When the contents of the drafted manual are reflected in the disaster management manuals of local governments, it is expected to reduce physical and mental health problems while evacuees are staying at the evacuation shelters.

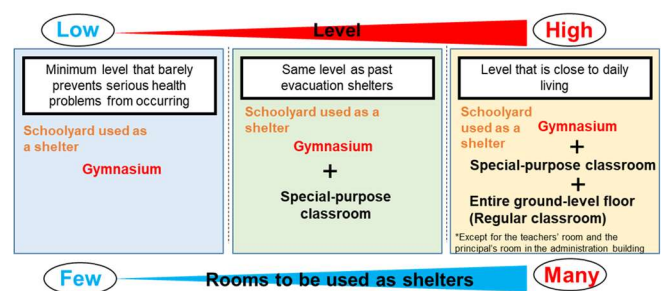


Figure 2: Examination of places, such as schools to be used as shelters depending on evacuation shelter function availability level

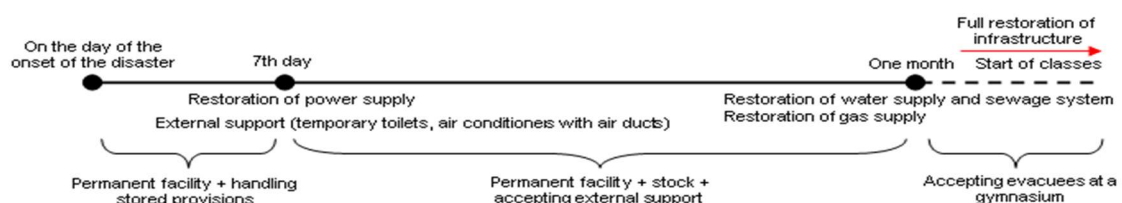


Figure 1: Time schedule of infrastructure and external support