

Methods of post occupancy assessment for post-disaster housing

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1 Introduction

There has been a large amount of post-disaster construction in Asia in recent decades due to natural disasters and a significant number of cases of indoor air quality problems caused by volatile organic compound emissions from building materials and other pollutants have been reported from new and renovated dwellings after such disasters. Indoor air quality sampling and chemical analyses are the most conventional research methods used in these studies. A post-occupancy assessment by means of sets of survey questionnaires was undertaken as a case study in order to identify other factors, which cannot be detected by these methods and can aggravate indoor air quality.

2 Materials/Methods

The study was conducted in 2001 on 148 post-disaster housing units built in Abuta, Japan, after a volcanic eruption destroyed much of the town, and investigated whether current indoor air quality guidelines were adequate to protect post-disaster housing occupants from sick building syndrome, and to determine building industry practice. A post occupancy assessment was designed, for residents and for manufacturers of building materials used for the post-disaster housing construction. In addition to a chemical analysis the survey questionnaires aimed analyzed health complaints and occupants behaviour inside the home. For this purpose, data analysis using variables related to household chemicals, housing ventilation and air-conditioning, and occupants' activities was carried out by non-parametric statistical techniques. A verification study was conducted with a control group of post-eruption residents who had been able to remain in or return to their own homes.

3 Results

The occupant's survey results suggest significant co-relationship between indoor air quality problems, post-disaster housing built environment and their unique lifestyle, especially 1) actions of changing indoor air to fresh external air and 2) duration of exposure to the post-disaster housing environment. The manufacturer's survey identified they were with indoor air quality guidelines; however none answered the protocol how to update production process for sick building syndrome prevention.

4 Conclusions

Findings indicated the presence of indoor air quality problems in the post-disaster housing with lifestyle as the main contributing factor. Four types of information were found to be critical data for statistical analysis: health conditions, behaviors/lifestyle, post-disaster housing environment, and building components. Human behavior and social aspects have not been taken sufficiently into consideration in indoor air quality issues, but need to be included for accurate assessment of post-disaster housing occupants' health and safety.