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**George C. Yao** is a professor in the Department of Architecture at the National Cheng Kung University. He received his Ph.D. degree in Civil Engineering from the University of Buffalo, USA. He is also the chief editor of a national accredited journal, Journal of Architecture. In the past 15 years, his research is devoted to the application of structural technique, such as structure analysis and modal testing, on non-structural component improvement against earthquakes. Several patents were developed as a result of his research. He also serves as an earthquake consultant for several high-tech factories in Taiwan. In the last two years, he participated in an international working group to develop an ISO standard for non-structural element.



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### **Emergency Shelter Design and Management for a Friendly Environment**

During the Morako flooding, one of the problems discovered is that although government issued warning signals for the imminent danger of mud flow and land slide but quite a few residents refused to move out of their home to the emergency shelters. Some of them suffered serious consequences and the government was blamed for not doing enough to protect her citizen. If natural disasters are going to be frequent in the future, what can be done to reduce these problems except using public authority to a forced evacuation by law.

After site survey to a couple of emergency shelters and conduct questionnaires on refugee in the shelters, some conclusions are drawn:

1. Emergency shelters are not safe. Because it was an ad-hoc stay, a lot of people were thrown into a large space, such as a school auditorium or community center, to spend several days together. These places are not designed to accommodate people to their individual needs. Refugees may lose their property, can not get enough sleep, and some times sexually harassed.
2. Pets are not allowed in the shelters. In many families, pets are like members in the house. In an emergency shelters, animals are not allowed inside. Therefore, people would rather gamble to stay at home to accompany their pets than moving into a shelter. There are incidences that people died because of this reason.
3. Social support at the shelter is inadequate. When people moved into a shelter, they need to start making plans for the aftermath. But refugees generally come to a shelter with nothing. Therefore adequate social support from the government and volunteer groups is extremely important. Otherwise, refugees may not want to leave their home next time when an emergency happens.

4. Location of shelter should be close to home. After the imminent danger is over, refugees want to check back on their house and plan for the recovery. A long distance travel from shelter back home may discourage people to go to the shelters.

#### **Recommendations for improvement**

1. Adequate pre-disaster planning and design on the shelter space is important for a more friendly shelter environment.
2. Reorganization of disaster management for a more efficient administration is important.
3. Pet issue need further research.

US experience may be a starting point for Taiwan to improve.