

# CARE: Public Post-Disaster Emergency Aid Facilities for Victims

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Kin Wai Michael Siu<sup>1</sup>

## Abstract

Over the past 20 years, an increasing number of emergency aid products for personal and family purposes have become available on the market. However, little attention has been focused on public facilities. This article is based on a joint design research project conducted by teams from Hong Kong, the United States, and the Chinese mainland. It is review in nature with the supplement of empirical fieldwork findings. Fieldwork was conducted in Wenchuan of China after an earthquake. Other cases include earthquakes (e.g., those in Japan, Taiwan, and mainland China) and floods (e.g., those in the United States and on the mainland China) were also reviewed as supplementary reference for the analysis. The article reviews the importance, design, and management of public post-disaster emergency aid facilities. It focuses on how the facilities can be designed and managed to achieve a better public living environment for victims immediately after disasters. It also aims to discuss how to maximize the cost-effectiveness of resources and benefits to victims and enhance recovery times. The key findings of the research show that it is necessary to have the provision of better-quality public post-disaster emergency facilities for victims who suffer immediately after disasters. A new approach of the directions and considerations in design and management called CARE, that is, comfort, accessibility, rapid, and effectiveness, is identified and discussed.

## Keywords

humanities, disaster management, public design, emergency design, emergency management, CARE, comfort, accessibility, rapid, effectiveness

## Introduction

Disaster is a word that carries negative connotations. According to many glossaries, dictionaries, and research and policy documents, “disaster” means “great or sudden misfortune, terrible accident (e.g., a great flood or fire, an earthquake, a serious defeat in war).” Although in recent years, governments and researchers have promoted prevention instead of post-disaster assistance, it is a fact that many natural and human-caused disasters still appear suddenly and unpredictably (Casale & Margottini, 2004; Farazmand, 2001; Mileti, 1999; Omulo, 1998; Scott & Wellheiser, 2002; Sinha, 2007; Tsuchiya & Shuto, 1995; Twigg, 1998). The results and effects of many disasters are difficult to determine before they happen (Fujita & Elvidge, 1998; Sinha, 2007; X. B. Wang, 2006). In other words, if human error or a natural event can be predicted and sufficient preventative measures taken, then its negative effects and misfortunes can be minimized and larger disasters can be avoided (Siu, 2008a; Z. Y. Wang, Zheng, & Li, 1998).

However, history and experience also tell us that disasters happen frequently, and some are difficult to predict or prevent. In fact, due to global climate change and the advances in some high-level but dangerous technologies such as nuclear power and chemical material inventions, the

frequency of disasters has increased (Cowie, 1998; Haddow, 2009; Kalantari, 2001; Omulo, 1998). Hence, the importance of post-disaster emergency aid facilities has also increased (Boano, 2009; Gustin, 2007; Ruwanpura, 2009; Xu, 2008). These facilities not only provide a better living environment for victims after disasters but also maximize the cost-effectiveness of resources and the benefits to victims and shorten recovery times (Mallick & Saud, 1995; Siu, 2008a; Vogel, 2001; Xu, 2008).

Emergency aid facilities can be classified into two categories: personal and household-oriented products, and public products and facilities. In the past, governments have only provided basic products and facilities (typically with very low design quality) for public and common use, such as public water supply, sanitation facilities, and shelters. Victims’ individual and familial needs have sometimes been neglected or put aside (Emergency Operations and Emergency Response Team, 2011; Filler, 2012; Xu, 2008). For the past

<sup>1</sup>The Hong Kong Polytechnic University, Kowloon, Hong Kong

## Corresponding Author:

Kin Wai Michael Siu, School of Design, The Hong Kong Polytechnic University, Hunghom, Kowloon, Hong Kong.  
Email: m.siu@polyu.edu.hk



10 years in the Western world, there has been a change. An increasing number of emergency aid products for personal and family purposes have become available on the market including small huts and houses for individual families, personal cooking facilities and utensils. For example, temporary family shelters and huts were delivered to the Wenchuan earthquake sites, in the Sichuan province of China, within 10 days. The governments and industries in different countries have started to realize that while individuals' needs and preferences should be addressed, retaining their emergency and basic needs should be the highest priority but it has negative consequences and less attention has been paid to public facilities (Farazmand, 2001; Kalantari, 2001; Siu, 2008a; Xu, 2008).

How can public post-disaster emergency aid facilities best fit the needs of disaster victims? What approaches and key considerations are required to plan, implement, and manage these public facilities?

## Research Method

There is little difference between the general and basic design and management quality requirements of facilities for general daily needs and those necessary for post-disaster purposes. The basic requirements are that they should be practical, user friendly, cost-effective, and psychologically comfortable. However, the purposes and functions of post-disaster facilities are different due to the circumstances in which they are used and the people who use them (Gustin, 2007; Xu, 2008).

This article is based on a joint design research project conducted by teams from Hong Kong, the United States, and the Chinese mainland. Case study approach is adopted in the project which focuses on how public post-disaster emergency aid facilities can be designed and managed to achieve a better public living environment for victims immediately after disasters. The project also aims to maximize the cost-effectiveness of resources and benefits to victims, and to enhance recovery times which is supported by the data collected from the fieldwork conducted in Wenchuan of China.

Regarding the fieldwork, the research team conducted site observations and interviews with the officials and victims in addition to participating in the re-building of the sites, including the design and management of public need-based facilities. In addition, particular cases include earthquakes (e.g., those in Japan, Taiwan, and mainland China) and floods (e.g., those in the United States and on the mainland China) were reviewed as supplementary references for the analysis (Table 1).

## Results and Discussion

### *CARE: Directions and Considerations in the Design and Management Post-Disaster Emergency Public Aid Facilities*

In the project, other than producing applied research outputs, the joint-research team also aimed to generate design

policies and principles for meeting the identified needs. As the former Prime Minister of China noted when he visited the Wenchuan earthquake site, the design and management (e.g., administration) of post-disaster facilities must be effective, accessible to all victims, and capable of rapid delivery. The design and management quality of the facilities should be high to ensure victims' comfort, given that they would be under difficult physical and psychological conditions.

The results of the research (particularly the findings from the study in Wenchuan) echo the Prime Minister's message and indicate that several design directions and considerations in post-disaster emergency public aid facilities should receive more attention, that is, they should be comfortable, accessible, rapid, and effective (CARE). In fact, in recent years, researchers and designers have advocated similar concerns in their studies and projects although they may not consider all four characteristics simultaneously. For example, Gustin (2007) and Xu (2008) identified that the design (e.g., original plan and design) and management (e.g., short-term and long-term arrangement, delivery, management) of post-disaster emergency aid facilities should provide different aspects of comfort to victims. Farazmand (2001) and Haddow (2009) argued that accessibility is a matter of sufficiency that coordinators, designers, and administrators need to consider it seriously. The studies and projects of The United Nations Children's Fund (UNICEF; 2007) and A/E Graphics (2011) indicated that a design's ability to meet and serve victims' needs in a timely manner is much more important. This matter is not only about the original intention design of a facility for a victim but also about its overall plan and management the facility. In a study on the effectiveness of post-disaster designs, Kalantari (2001) pointed out that many existing so-called good designs are wasted in which they cannot be effectively managed to serve the actual needs of victims. (These four areas are discussed further in the following sections.)

The CARE concept is used here to facilitate discussion and make the four considerations easy to remember while promoting high-quality user-fit in designs that are appropriate to all victims/users. As agreed by the research team of the project, the CARE concept should not be considered a golden rule for all situations, but it is a good set of directions for the design and management consideration and also further exploration and discussion.

The arrangement of the letters in the word "CARE" does not imply a sequence or priority when considering the degree of importance of each of the four considerations. Instead, it simply offers an easily remembered mnemonic to help people adopt this approach. CARE reflects the core spirit and objective of post-disaster emergency public aid facilities in that they should be specifically tailored to the victims' needs.

### *Comfort*

The term *Comfortable* addresses victims' satisfaction and comfort. When we reviewed the existing post-disaster emergency public aid facilities, many did not meet this design and

**Table 1.** Selected Research Cases Related to Post-Disaster Needs.

	Particular urgent matters and needs	General deficiency not meeting the needs and preferences (related public facilities selected for in-depth study)
Kobe earthquake (southern part of Hyōgo Prefecture; 1995)	Provision of temporary shelters in suburbs.	Due to the serious earthquake and destruction of the construction and widely spread sites, transportation of temporary shelters could not reach the suburbs promptly. Victims needed to face very difficult time for sheltering at the beginning though most of them were patient to wait for the help.
	Provision of public communication facilities.	Due to inaccessible telecommunication system in suburbs and limited technology mobile communication at that moment, victims had no way to call for help and get connection with their other family members to report for their situation.
South Asia tsunami (2004)	Provision of clean water.	Insufficient of provision of water facilities, in particular at the beginning there was a lack of public water supply facilities for all victims.
	Provision of sanitation facilities.	Public toilets and hygiene were set up late that hygiene problems occurred. People dumped human and animal waste. Due to the poor provision of public lighting facilities, people also more tended to dump waste close to their temporary living areas. Some sanitation facilities could not be or with high difficulty to be delivered to the places that were remote for contact and accessibility.
New Orleans flooding (effects of Hurricane Katrina; 2005)	Removing/draining off dirty and hazardous water generated by the flooding	Flooding caused water to draw back from underground drainage pipes. The water then mixed with a lot of domestic hazardous and toxic liquid (e.g., detergent, bleaching liquid) and animal dead bodies. The mixture of dirty and toxic water covered most of the areas at low level (i.e., under normal sea level).
	Assistance of general human circulation.	Most of the clean water supply and storage facilities were contaminated and polluted. However, the public water supply system was provided very late. Such situation also caused police to face difficulty in controlling people not go further into chaotic situation for the need of water as well as other daily necessities (e.g., panic buying water from stores and supermarkets).
	Public special facilities for pumping, draining, and removing dirty and hazardous water from the large area of flooding areas. Dirty and harassed water were mainly the mixture of seawater, domestic hazardous and toxic substances, and animal dead bodies.	There was a lack of transportation facilities (with large capacity) for rescuing and evacuating victims out of the dirty water.
	Public facilities for assisting human movement in the flooding areas.	Lacking public lighting facilities, including the provision of portable power supply/generator for other emergency and daily purpose. This situation also caused further negative effect on other problems.
Wenchuan earthquake (2008)	Public lighting facilities due to the wide area of electricity shutdown (i.e., unsafe for provision of electricity).	
	Provision of temporary shelters.	The earthquake territory was large and the sites were widely spread and many constructions were damaged (Figures 1 and 2). Temporary shelters were insufficient at the beginning.

(continued)

Table 1. (continued)

Particular urgent matters and needs	General deficiency not meeting the needs and preferences (related public facilities selected for in-depth study)
Provision of sanitation facilities.	Some of the provided shelters were also poor in quality, in particular with poor ventilation and repellant to insects. A large number and unrelated victims (i.e., several families) were packed in a very small shelter. Victims complained about not only the physical needs but also the psychological needs.
Provision of public facilities for the management/handling of human and animal dead bodies.	Due to the lack of public sanitation facilities (e.g., toilets and waste dumping facilities), solid and human wastes were all over the living areas. Bad smell and insects also caused difficult living condition to victims, rescue teams, and volunteers. Due to the large number of dead victims and animals, urgent management and handling facilities for dead bodies could not work effectively.



**Figure 1.** Natural disasters can cause serious damage to constructions as well as people's daily lives.  
Source. Author.

management objective. Sometimes, policy makers and designers may use the difficulties and deprivations of a post-disaster environment as an excuse and expect disaster victims to “tolerate” unsatisfactory quality. Most of the time, it seems to imply to disaster victims, “You are in an extreme environment at the worst time. You cannot ask for more than what we offer.” For example, according to interviews with the officials and volunteers assisting the recovery of Wenchuan earthquake, some of the victims requested to have better arranged tents for families (i.e., with a chance to stay together as the original family). However, due to the lacking of resources, difficult management environment, and uncertain situation, in particular during the first two weeks after the disaster, this kind of basic request was difficult to be served.



**Figure 2.** A large number of constructions in Sichuan were damaged after the earthquake.  
Source. Author.

In fact, it is both sad and disappointing that a society continuously upgrading due to economic growth still invests deficient resources in post-disaster emergency public aid facilities (Gustin, 2007; Xu, 2008). Because the quality of many these facilities do not meet the same design and

provision quality level of our daily facilities, survival victims after disasters continue to live—survive—in a very uncomfortable way. Today's post-disaster emergency public hygiene facilities are a good example. Most of the time, they are of very poor quality in its design and availability. For example, in many sites after disasters, there are no public hygiene facilities, such as toilets. This not only creates a worsening situation in the disaster sites but also produces physical and psychological discomfort for the victims, including older persons, children, and the disabled. In Wenchuan earthquake disaster sites, according to observations, some site-management officials and volunteer helpers already gave quite a lot of warnings and reminders to the victims not to dispose human waste elsewhere as they liked. However, the result was unpleasant and created some hygiene problems. One of the major causes of the situation was the lack of appropriate toilet facilities (i.e., due to the lacking of facilities and/or the ineffective delivery of facilities). In addition, some mild-grade injury victims even could not able to access the crude facilities due to the unfavorable physical condition.

“Comfortable” means not only the consideration of functional or physical factors but also psychological, social, and cultural factors (Green & Jordan, 2002; Siu, 2009b). In the past, nearly all post-disaster aid facilities only claimed to serve the most urgent, basic—and sometimes minimal—survival needs. (Obviously, sometimes even these urgent, basic minimal and survival needs could not be fulfilled.) This approach is neither correct nor sufficient. An increasing number of studies have proved that psychological, social, and cultural factors are important in design and management, including those facilities applied to the needs of disaster victims. For example, after the New Orleans typhoon and flooding disaster in the United States during 2005, and the Sichuan earthquake disaster in China during 2008, public hygiene facilities were urgently needed. Public toilets, in particular, provide not only the physical but also the psychological comfort necessary to the basic dignity of human beings (Siu, 2008b).

Studies have also proved that fulfilling psychological, social, and cultural needs can maximize the benefit to victims and enhance their speed of recovery (Newhill & Sites, 2005; Weisaeth, 1994, see also the classic writing by Wolfenstein, 1957). These kinds of comfort can also ease victims' pain, create a more harmonized post-disaster environment, and enhance the effectiveness of the physical function of designs. Take, for example, many of the existing post-disaster aid products, facilities, and consumables that are imported from, or freely supplied by, other countries (i.e., places with different cultures and social settings). These designs and materials may not fit the local needs of a country, region, or community. For an extreme example, war victims received aid materials that were actually manufactured in the country that attacked their own. The victims discovered this fact on the packaging. It is easy to imagine how

difficult this was for the victims who had no choice but to use the materials. This situation happened during the Gulf War period that the United States provided supporting materials for victims were delivered to some sites which were supposed being attacked by the United States. Similarly, people in different parts of the world do not have the same expectations about how toilets are designed and used. These two cases, one psychological and the other both physical and psychological, offer direction to policy makers, designers, and in particular management persons as they design, coordinate, and manage post-disaster emergency public aid facilities (Siu, 2008a).

### *Accessibility*

“Accessible” post-disaster emergency public aid facilities are those that victims with different capabilities can access fairly and equally. In other words, the spirit of accessibility suggests that there should be no discrimination among different victims as they access the facilities (Siu, 2008b). It is a matter particularly related to the quality of facility management. According to the general definitions of the United Nations and many human right agencies, there are two types of discrimination: direct and indirect (European Union Agency for Fundamental Rights, 2011; Icelandic Human Rights Centre, 2001). Direct discrimination occurs when a person is treated less favorably than another person in similar circumstances. Indirect discrimination occurs when a condition or requirement is applied to everyone but which in practice affects some people more adversely, or is to their detriment, and such a condition or requirement cannot be justified (Equal Opportunity Commission, 1998; Siu, 2008a, 2008b).

To eliminate direct discrimination, public aid facilities must be designed and managed (in particular the latter) to a degree that all victims, including older persons, children, and the persons with special needs (e.g., the disabled), have the same right of access. To eliminate indirect discrimination, special assistance and help must be provided to victims with special needs to enable them to access the facilities. For example, in a meeting with the victims of the Sichuan earthquake, some people raised concerns about the needs of older and disabled persons. Such as those with visually impaired and physical disabilities, they always could access to places independently (even after several months of the disaster). This situation caused not only inconvenience to the family members but also psychological discomfort to the disabled victims. As stated by the interviewed site-management officials and non-governmental organization's (NGO) representatives, sometimes, it was difficult to serve victims with special disabilities while they needed to consider the macro-situation. On the other hand, as requested by some disabled victims, they more expected that some facilities could at least allow them to take care of their personal life at home, in particular, after a period of time the first stage of disaster settlement had been done.

“Accessible” also implies a matter of sufficiency (Farazmand, 2001; Haddow, 2009; Siu, 2008b). It addresses the unfortunate fact that many problems after disasters are related to the availability and continuous effective management of resources. It is easy to foresee that lacking sufficient resources and good management result in chaos, confrontation among victims, and further misfortune (Weisaeth, 1994). This situation is particular to emergency public aid facilities. For example, confrontations and arguments always occur at the places designated for water distribution. Public hygiene facilities such as toilets are also places where problems occur, due to insufficient provision of facilities resulting in long queues. These situations also generate further problems, which make the already unpleasant post-disaster environment worse (EcoSur, 2013; Syam & Ohno, 2010). For example, lacking the patience to wait for public toilets, victims may leave human waste in a disorderly manner so that it causes serious hygiene problems such as water-carried diseases including diarrhea and cholera. Poor management in clearing human waste from public toilets also makes the situation worse. In such situations, further confrontations and arguments among victims will occur. In fact, these situations happened frequently in New Orleans in 2005 and Wenchuan in 2008, as well as at many disaster sites (particularly remote villages) in Indonesia, Sri Lanka, India, and Thailand after the 2004 Indian Ocean earthquake (The World Bank, 2008). In addition, during the visit to Wenchuan, it was observed that many constructions had been destroyed. The destruction implied not only the building construction above the ground but also the facilities under the ground, for example, water supply and drainage systems. All these resulted in problems of accessibility (i.e., insufficient) of toilets and waste dumping facilities for the victims as well as the people giving help in the site. The officials responsible for the management of health matters indicated that the poor accessibility (i.e., insufficient) of toilets and waste dumping facilities also created ripple effects to generate other problems. For example, the poor managed waste due to the poor accessible of facilities caused contamination of some drink facilities.

When it comes to post-disaster emergency needs, it seems that it is quite rational and reasonable that policy makers tend to take care of the majority and put the needs of the minority disregarded or as a lower priority. However, as indicated by some interviewed victims in the Taipei and Wenchuan earthquake sites, some of them could not access to the facilities (or feel difficult to use or share the provided facilities). Some of the claimed reasons were due to the cultural and religion preferences. For example, some of the victims stated that they could not accept some of public cooking utensils which had contained some food and substances which were taboo or unpleasant practice related to their religion. Thus, design and management persons should keep minority needs in mind and ensure that their designs satisfy the requirements of the widest possible range of people, including those with particular social and cultural preferences.

## Rapid

Among all situations in which help and assistance are required, post-disaster situations require the most rapid help because many of the already available resources have been lost, are insufficient, or are out of order (Farazmand, 2001; Mallick & Saud, 1995; Vogel, 2001). “Emergency public aid” implies urgent attention to public needs. Providing rapid help and assistance through good quality designs after disasters can be a matter of life and death. For example, in the days immediately after the devastating floods in Sirajganj, Bangladesh (August 14, 2007), dirty, contaminated water was everywhere in and around the banks of the Jamuna River and not a single drop of clean drinking water could be found (UNICEF, 2007). In response to the millions who were crying out for drinking water, Canada’s Global Medic and the United Kingdom’s Muslim Aid immediately collaborated to use a new Canadian technology (i.e., a mobile water purification plant) to mitigate the severe scarcity of purified water. Installed for the first time in Bangladesh, the technology provided 12 liters of clean water every 3 min, dramatically reducing the risk of water-borne diseases such as cholera. NGOs distributed cans containing the treated water, with 10,000 cans available to ensure that purified water was readily accessible. The purification systems were capable of providing clean drinking water for 100,000 people. Canada also set up a fully functional, self-contained inflatable field hospital (with medical facilities) to provide primary health care to the thousands of people already sick from drinking contaminated water in the days before the humanitarian aid arrived. Staffed by local doctors and nurses, the inflatable field hospital has the capacity to treat more than 30,000 people and is fully equipped with hospital beds, basic medicines, and so on. In fact, all these kinds of rapid action provided critical help to many victims.

“Rapid” thus implies facilities that can serve the actual needs of victims as soon as possible. As advocated by some researchers and architects, urgency is an essential role of post-disaster management (A/E Graphics, 2011). To achieve this, according to the empirical observations in Sichuan and reviews of other cases (see also Table 1), the provided post-disaster facilities must fulfill the following priority and requirements. Regarding the priority, life rescue and protection should be in the highest priority. Based on this direction of thinking, the prevention of further damage and other negative consequences is also in a high priority. In other words, the first priority should be rescuing affected population (direct victims and indirect-affected victims); the second is providing shelter and daily needs (Figure 3); and the third is rehabilitating affected population and restoring livelihood (see also International Federation of Red Cross and Red Crescent Societies, 2011b). Regarding the requirements, the post-disaster facilities must be easy and convenient to locally produce, store (so that there is an adequate stockpile on hand at all times), transport, distribute, construct, fabricate, maintain, and replace. As the disaster cases happened in China in



**Figure 3.** First set of temporary shelters were rapidly set up after the earthquake in Wenchuan.

Source. Author.

recent years, on the one hand, nearby regions' support and provision of post-disaster facilities as well as consumables can match better the needs of victims. On the other hand, post-disaster assistance most of the time is a long-term action. Supply by nearby regions is much helpful and with a higher degree of persistence. Obviously, as indicated by one of the interviewed volunteer management assistance in Sichuan, merely having good designs is not sufficient. Good policy, planning, handling, and efficient management of facilities before and at disaster sites are also essential (Emergency Operations and Emergency Response Team, 2011). This is same as what the Prime Minister of China emphasized several times during his visits to Wenchuan disaster sites that the local management officers at different levels should consider post-disaster assistance as the "importance of importance" (重中之重) and take action immediately—rapidly—to address victims' needs and requests.

### Effectiveness

"Effective" means meeting the primary objectives and actual needs with the highest quality at the lowest cost and effort. In other words, it means producing, selecting, and managing the right tool, and using it in the right way to do a job. "Effective" also implies a high quality of management in terms of minimal consumption, loss, and waste of resources. However, when we look at many recent disaster-assistance plans and events, all too often resources have been wasted (Kalantari, 2001). Sometimes, an overwhelming quantity of facilities is transported to a place where there is no need. This is particularly problematic when another place may lack these same facilities.

Furthermore, "effective" suggests the prediction and planning necessary to successfully deal with the priority of needs after a disaster (Kalantari, 2001; Siu, 2008a). Sometimes, post-disaster aid facilities are not provided at the right time. Some arrive too late, when the victims no longer need them,

or the victims experience new and urgent needs that cannot be accommodated. For example, victims of mudslides who had to dig out casualties with their hands received shipments of shovels days later, when their current need was for tents. And, in the earthquake in Yunnan 2014, some complaints were received that wrong aids and facilities were delivered. Such as thick cotton quilts for winters were delivery to the sites, but actually Yunnan is famously hot in general and at that time of was right in the summer session. Regardless the reason of this wrong management (e.g., supply, delivery), this ineffective assistance finally gave not only no help to the victims but also aroused the public dissatisfaction and negative effect to the call-for-help action. In short, effective means meeting the demand at the right time, with the right facility, right method, and the right effort. To avoid the supply and delivery of the wrong aids, an accurate, appropriate, and effective message transmission; reliable management; and high quality of quality assurance are all important. And, an experience and independent (or, specially duty-assigned) checking mechanism or working force for all these are essential (Siu, 2008a; X. B. Wang, 2006; see also International Federation of Red Cross and Red Crescent Societies, 2011a).

The effectiveness of public aid facilities relies on good distribution and sharing (Gustin, 2007; Xu, 2008). It also refers to a basic tenet of design and management of the facilities: that it should not aim to accommodate personal needs in an individual, separated, and isolated way, but in a more public way. In the past, this was the original rationale for serving victims of disaster as a public duty. At that time, resources were very limited, thus sharing facilities was the only way to enable a large number of victims to survive. However, following the growth of the global economy and the greater fulfillment of people's individual wants, personal and family facilities have become more readily available in recent years. We cannot deny that this is an improvement. However, as mentioned above, it also creates a drawback in which designers and manufacturers start to pay less attention to improving the quality of public facilities, in particular the design and provision of public works and facilities (Dikmen, 2005).

The distribution and sharing of facilities is directly and indirectly related to management matters. In particular, in very deprived situations after disasters, many victims may try to take possession of as many resources (even public resources) as possible to create a reserve. Sometimes, this type of hoarding results in individuals having more than they need, and other times, the individuals who take the resources actually have no need or even hope to sell the resources at an inflated profit. In many post-disaster situations, this kind of hoarding can result in damaged, wasted, and misallocated resources. Thus, briefly, "effective" refers to good management in the allocation, distribution, assignment, security, and protection of public resources (Gustin, 2007). The absence of good management can result in not only wasted resources but also additional disasters and misfortunes. In the case of Wenchuan, according to observation and also later more mass media reports, after the disaster and under the influence of

extensive mass media broadcasts, many people reacted by sending large quantities of the same kinds of emergency aid facilities. This was so much the case that the local government had to announce a temporary halt on receiving some facilities to ensure the proper management of aid facilities and a balanced response to the disaster. A similar management problem occurred when so many people came to the disaster sites to volunteer their help that the rescue service management had to stop some untrained volunteers from participating because they could have endangered the victims or themselves, or created even more difficulties for the rescue teams. In fact, this situation has not got much improvement even experience has been obtained for many years. For example, the above situation had not only occurred in Wenchuan disaster but also appeared in the most recent China's Yunnan disaster. Nevertheless, one of the improvement situations is that the management noticed the situation earlier and then set up some control gates and approval authority to identify (i.e., screen) for the "appropriate" and "authorised" people (including official workers and volunteers) to enter the sites to give appropriate and effective assistance to the victims.

As with "accessible," "effective" includes flexibility (Siu, 2009a). Narrowly focused and biased considerations and purposes limit applications. Moreover, it is unrealistic to request that government, regional and local authorities, and individuals reserve a large quantity of different types of emergency public aid facilities for different disaster situations. As mentioned above, disaster means sudden and unpredictable misfortune, which implies that most of the time post-disaster needs are difficult to predict. Moreover, post-disaster needs are urgent needs, and resources designed for specific types of disasters typically come "too late." Thus, flexible applications and extensions of other applications are the most sensible and effective design approach for post-disaster emergency public aid facilities. For example, facilities using flexible modular structures that are highly compatible with other facilities for modification, partial and complete replacement, and maintenance are good design approaches. The recent newly designed frames and structural members and facility attachments (e.g., window and door outlets; indoor ventilation facilities) for different types and sizes of temporary tents for victims are good examples.

## Conclusion

The concept that "you cannot ask for more" should be discouraged as a way of thinking, because it constrains the design and in particular management of post-disaster emergency public aid facilities. The difficult situations that follow a disaster should also not be considered an excuse to allow policy makers, designers, and management to tolerate, or ask the victims to tolerate, poor-quality facilities. This article advocates the design and management of better-quality facilities for victims who suffer immediately after disasters. The four perspectives (CARE) initiate high-quality (in terms of a holistic and

user-centered approach) design and management for the post-disaster emergency public aid facilities, and encourage a wider assortment of user comfort types (i.e., satisfaction, pleasure). The perspectives also promote all users having fair accessibility to facilities and urge a rapid response in providing facilities to users who are still living (i.e., surviving) in a difficult and deprived time and environment. Furthermore, the CARE concept insists that governments have effective facilities that can meet the actual needs of users at the lowest cost, and with minimum consumption, loss, and waste of resources.

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### Author Biography

**Kin Wai Michael Siu** is chair professor of Public Design and lab leader of the Public Design Lab, The Hong Kong Polytechnic University. He was Fulbright Scholar of Massachusetts Institute of Technology and ASIA Fellow of the National University of Singapore. His research interests are in public design, inclusive design, and user reception.