

KNOWLEDGE NOTE 4-3

CLUSTER 4: Recovery Planning

Transitional Shelter



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Transitional shelter can play a crucial role in housing reconstruction following a megadisaster. Reconstruction of permanent housing cannot move forward until a number of complex issues are settled, such as relocation planning and removal of debris. Even after plans are agreed on and reconstruction begins, it may take several years for permanent housing to be completed. In this context, affected people may need to rely on transitional shelter for extended periods of time, and this will have a significant effect not only on housing, but also on their overall recovery including livelihood rehabilitation.

FINDINGS

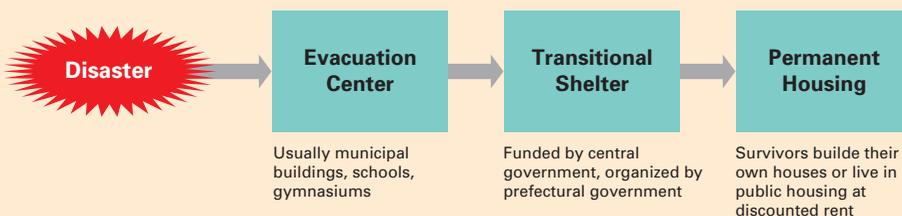
The Great Eastern Japan Earthquake (GEJE) led to the total collapse of some 108,000 residential houses. An additional 117,000 houses suffered damage to more than half of their structure (KN 1-2). As a result, more than 450,000 people had to be evacuated to evacuation centers. Within four months of the disaster, 75 percent of the centers had closed, as people were moved gradually to transitional shelters (KN 3-5).

Lessons learned from the Great Hanshin-Awaji (Kobe) Earthquake of 1995 and other disasters led the Japanese government to promote the concept of networked relocation following the GEJE, when an attempt was made to preserve, to the extent possible, existing social networks. The government also offered multiple options for transitional shelter, depending on geography, reconstruction planning, and local preferences. These included temporary housing, mostly prefabricated; government-owned accommodation and public housing; and private rental apartments, which proved popular due to lower prices, higher comfort, and greater versatility. Local governments, volunteers, and nongovernmental organizations (NGOs) provided complementary support, including counseling. As relocation into transitional shelters proceeded, several innovations were introduced, including physical upgrades to improve comfort, wooden housing (easier to convert into permanent use), and multiple-story accommodation. Key challenges have been the lack of sufficient land due to the volume of remaining debris, as well as logistical difficulties in keeping track of disaster survivors to ensure ongoing support. This note discusses the GEJE experience and offers lessons learned with application to developing countries.

JAPANESE FRAMEWORK FOR TRANSITIONAL SHELTER

Prefectural governments are responsible for transitional shelter according to the provisions of the Japanese Disaster Relief Act (1947), with funds allocated from the central government. The prefecture, outside of exceptional cases, can choose the type and form of housing as well as hire private construction companies. Municipal governments coordinate with prefectures for the selection of sites, distribution of affected people, and maintenance of shelters. Affected people are expected to move into permanent accommodation within a period of 2 years (the time normally allowed by Japanese law), and at their own cost, although they receive up to ¥3 million (\$37,500) in compensation from the government, depending on the housing damage. Alternatively, they can rent public housing at subsidized rates. The usual flow of the housing reconstruction process is shown in figure 1.

FIGURE 1: **The housing recovery process in Japan**



BASIC TYPES OF TRANSITIONAL SHELTERS USED AFTER THE GEJE

The government adopted three main programs of transitional shelters in the aftermath of the GEJE (figure 2):

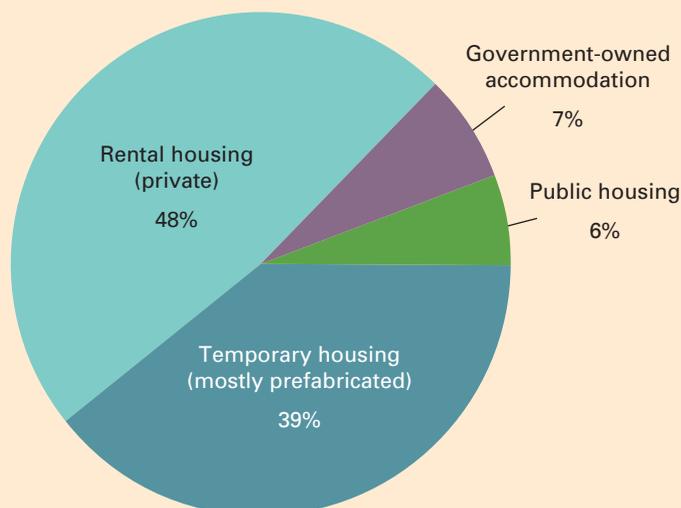
- Newly constructed temporary housing (mostly prefabricated by private contractors)
- Private rental apartments
- Existing public housing and government-owned accommodations (previously built to house government officials)

The type of transitional shelter was influenced by geographic and demographic considerations (figure 3).

- Temporary housing were commonly used in the **ria coastal areas** north of Sendai (including part of the Miyagi Prefecture and most of the Iwate Prefecture), where most of the resident houses suffered major destruction. This area is characterized by steep and fjord like topography, and both small fishing villages and larger towns located near the ocean; there is little available land near the ocean fit for building.

FIGURE 2: **Characteristics of transitional shelters used after the GEJE (as of December 27, 2011)**

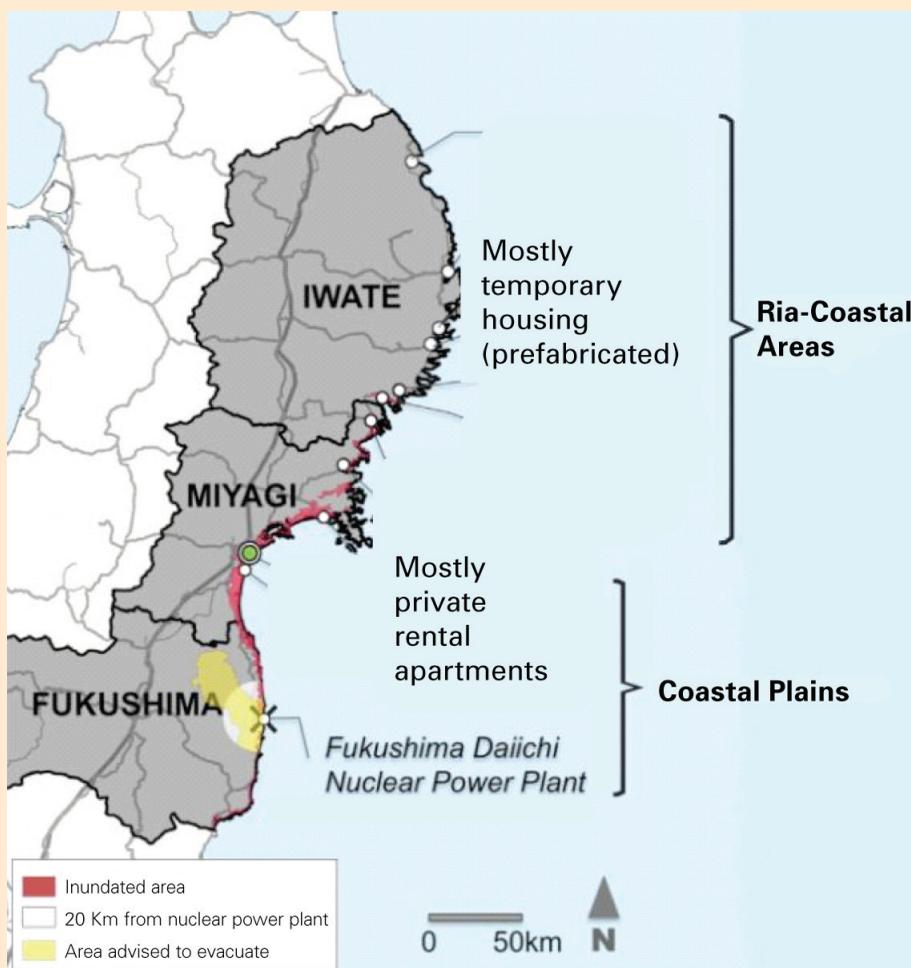
<i>Shelter type</i>	<i>Number of houses allocated or chosen</i>	<i>Number of houses supplied</i>
Temporary housing (mostly prefabricated)	52,182	52,620
Government-owned accommodations	9,832	38,464
Public housing	8,238	24,505
Private rental housing	65,692	—
Total	135,944	115,589



Source: Disaster Management Headquarters.

- Private rental apartments predominated in Sendai City and urban areas in the **coastal plains**, much of it undamaged.
- The **towns in Fukushima Prefecture** presented a unique case: due to the radiation hazard residents had to be evacuated for an uncertain length of time. Facing the prospect of having to provide long-term transitional shelter (possibly for many years), the Fukushima Prefecture decided to construct more than 4,000 units of wooden temporary housing, including larger-sized units for larger families. As of March 2012, about 60,000 residents had evacuated the Fukushima Prefecture to other prefectures.

FIGURE 3: **Predominant transitional shelter in affected areas**



TEMPORARY HOUSING

Temporary housing, typically one-story prefabricated row houses built by private companies (29 square meters), is the most common type of transitional shelter used in Japan (figure 4). Typical construction costs have ranged from \$5.7 to \$6.6 million (\$71,000-\$80,500 per unit), slightly more than double the price of the 1995 Kobe earthquake. As of early 2012, some 52,000 housing units have been built.

Many prefectures have preexisting agreements with construction companies to build prefabricated temporary housing during emergencies. But even with these agreements in place, it was not possible for construction companies to build all the units needed immedi-

FIGURE 4: **Typical prefabricated temporary houses**



Small group of temporary houses near former neighborhood



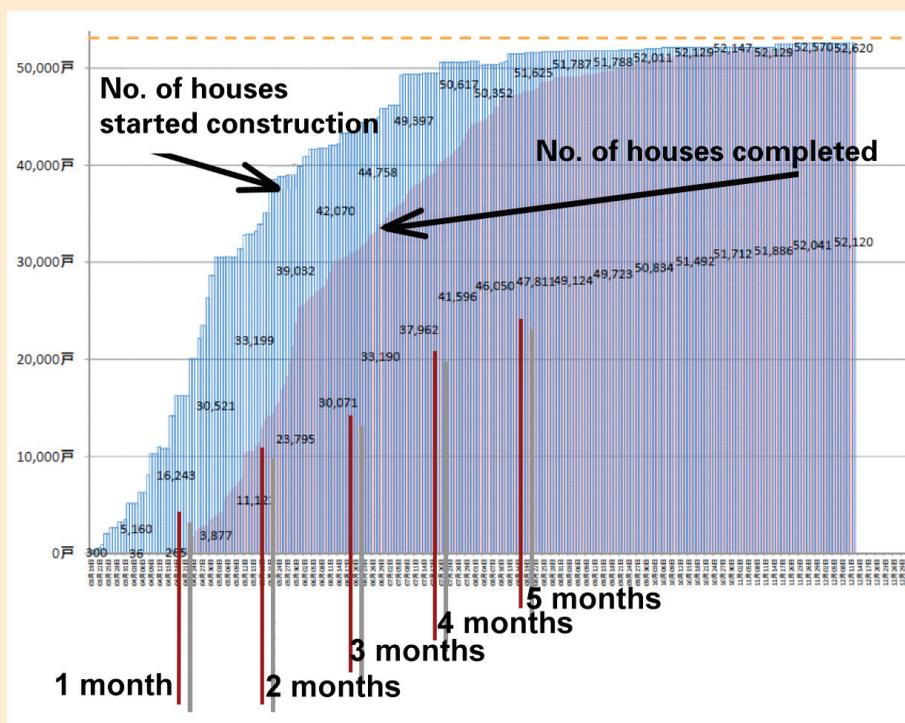
Temporary houses in Ofunato, Iwate; Onagawa, Miyagi

ately, due to shortages of construction materials and workers. Because of such shortages and a lack of coordination across companies, the quality and level of construction of temporary houses varies across the disaster area.

Government policy requires that temporary housing be built on publicly owned land, outside high-risk areas. This posed a significant challenge for much of the disaster area, particularly along the ria coastline north of Sendai, where there was almost no available land—a major reason for the initial delays in the construction of temporary housing. The first residents moved only in April/May, one to two months after the disaster (figure 5).

In many towns, however, a high percentage of temporary housing remained empty, as prospective residents found them inconvenient (too distant from their original villages), uncomfortable, and much smaller than their original houses. The houses were constructed using low-quality, bare-minimum standards, and were not suited to the cold climate of the Tohoku region. Problems included gaps between walls and roofs, drafts, and the absence of noise or temperature insulation, shelves or storage areas, places to sit outside, an awning or enclosure around the front door, and a veranda outside the sliding door (which made it dangerous for the elderly hanging laundry, or small children). Moreover, as allocations were

FIGURE 5: Number of temporary houses completed



Source: MLIT.

determined by lottery, residents complained that they did not know their neighbors and lost their community connections. Some people preferred to stay in evacuation shelters as long as possible because food and utilities were provided for (a trend also observed following other megadisasters).

PRIVATE RENTAL APARTMENTS

Although not widely used during the Kobe earthquake, privately owned rental housing became the preferred form of transitional shelter after the GEJE, with about 66,000 units used by disaster victims. Rents were paid directly by the government. Such apartments were widely used in the urban areas of Tohoku, including Sendai City.

As also observed in Haiti, private rental units offer many advantages over conventional temporary houses: they are considerably cheaper—about ¥0.7 million–¥1.5 million (\$9,000–\$18,000) per year per unit or for a two-year average stay, which makes them two to three times less costly than temporary housing. They also allow affected people to move into

transitional shelters quickly (people started moving in less than a month after the disaster, compared to one to two months for the prefabricated units). In addition, regular apartments are considered more comfortable and livable for residents.

Nonetheless, private rental apartments are not a viable option for areas that suffer extensive destruction of existing housing stock. In addition, the fact that affected residents are scattered across existing housing units makes it difficult for government and relief workers to track them to provide the necessary information and support. It also makes disaster survivors more prone to losing social connections than when they are grouped together in conventional temporary housing.

PUBLIC HOUSING AND GOVERNMENT-OWNED ACCOMMODATIONS

Some disaster survivors moved into public housing managed by government entities, as well as into other government-owned residential facilities. Public housing shares many of the positive features of private rental housing, although it can also lead to residents' isolation, with limited access to the information and social networks found in the more aggregated temporary housing.

SUPPORT SYSTEMS

COMMUNITY BUILDING AND EMOTIONAL CARE

Throughout the disaster region, local governments, volunteers, and NGOs started numerous support initiatives to help disaster victims at transitional shelters. These included both physical (provision of furniture, building of additions or improvements, provision of community spaces, buses) and nonphysical support (social events, counseling, health checks, visits, shopping and support for elderly and children).

One example is the Disaster Victims Support Center, started by the town government of Minami-sanriku (Miyagi Prefecture) through the National Government Emergency Employment Fund. The center hired about 100 disaster victims to visit other affected people in temporary shelters, counsel them, and provide support to the most vulnerable. It also established one satellite location in each of the four regions of the town to be closer to the temporary housing residents. This initiative built upon the earlier example of the community centers established in the aftermath of the Kobe earthquake (box 1).

The Japanese Red Cross provided six electric household appliances (televisions, refrigerators, washing machines, cooking pots, microwave ovens, and hot water pots) to those families who moved to new but empty prefabricated houses and apartments. By June 2012 the number of beneficiary families reached over 130,000 throughout Japan, from Okinawa to Hokkaido, including those families displaced by the Fukushima nuclear accident.

TRANSPORTATION

One of the key difficulties faced by residents of transitional shelter is the distance from work, schools, hospitals, and shopping. Providing adequate transportation to support these residents is therefore an important challenge.

BOX 1: The case of community centers at transitional shelter sites after the Kobe earthquake

A total of 232 community centers were opened as bases to support residents, established by an association of local organizations:

- Volunteers and nonprofit organizations manage the centers.
- Life support advisors visit each house to confirm safety and provide advice.
- Events and gatherings are held by volunteers to promote communication among residents.
- Establishment of community-based organizations is supported.



LIVELIHOOD SUPPORT

Many support groups have started projects to assist residents of transitional shelters in generating side incomes. Examples include the friendship bracelet “Tamaki” produced by wives of fishermen, and hammocks produced by fishermen (both from fishing nets). Other women’s groups have started making and selling products such as key chains, fabric bags, and slippers. The link between transitional shelter and livelihoods has proven important not only to help improve the socioeconomic status of affected people, but also their psychological recovery (see KN 4-5).

THE EVOLUTION OF TRANSITIONAL SHELTERS IN THE GEJE

NETWORKED (GROUP) RELOCATION

Given the shortage of publicly available land in disaster-stricken areas, the government allowed some temporary housing units to be built on privately owned land.

Lessons were also learned from Kobe. Many elderly residents had died a solitary death after being separated from their social networks by lottery systems that dispersed them into transitional shelters. In the GEJE, a lottery system was also used during the initial stages of the recovery as the number of temporary houses were much fewer than the number of affected people wanting to move out of the emergency shelters. In Minami-sanriku (Miyagi), for example, some 62 percent of the temporary shelters followed the lottery system.

As more temporary houses became available, municipalities made an effort to support community building and design group housing units that encouraged interaction between neighbors. In Minami-sanriku, therefore, two models of temporary group housing were adopted: large group sites built on public land (schools or athletic facilities) and smaller group sites built on private land. On the larger group sites (built earlier), prospective residents were chosen by lottery, which prioritized senior citizens, families with small children, and other vulnerable residents. Affected people were also given the choice to go to a large group site sooner, or wait a little longer and be relocated collectively into one of the smaller group sites, closer to their former neighborhoods. Smaller group sites were built specifically to support collective group relocation from nearby neighborhoods, to keep affected communities relatively intact.

PHYSICAL IMPROVEMENTS

The close network of support to affected people enabled local governments and NGOs to do some improvements to the poor **physical condition of the temporary housing units** by adding awnings, balconies or verandas, and insulation or soundproof materials, and by providing benches, shelves, and other indoor furniture (figure 6). But problems of basic construction persisted over the entire disaster area, and it was very difficult to improve the situation for all residents.

FIGURE 6 (left): **Improvements to temporary housing—adding insulation to the walls and double-pane windows**

FIGURE 7 (right): **Multiple-story temporary housing made with stacked containers**



Multiple-story temporary housing made from stacked containers was introduced in Onagawa town to compensate for the scarcity of available land. Stacking the containers to form two- and three-story group temporary housing also helped reduce overall construction time (figure 7).

Wooden temporary housing has been used extensively in Fukushima Prefecture, where long-term, temporary residency is required, as well as in Sumita, Rikuzentakata, and Tono towns. The main advantage is that it can be used for longer periods than the prefabricated houses, and can potentially be converted and/or reused for the construction of permanent housing. It is also more comfortable and warmer, and has the advantages of being disposable. But it is not as standardized as the prefabricated type, and cannot easily be produced in large quantities offsite. In addition, in megadisasters such as Aceh, the extensive use of wood resources has contributed to deforestation of already fragile environments.

TEMPORARY TO PERMANENT HOUSING

In common with other megadisasters (for example, Haiti, Aceh and Yogyakarta in Indonesia, and Chuetsu and Kobe in Japan), it is expected that owner-built transitional shelter will start to emerge. Like wooden temporary housing, it can be reusable and converted to permanent use.

In the 2006 Central Java earthquake in Yogyakarta, the government promoted a “roof first” concept to transitional shelter, allowing residents to incrementally finish the structure. The 2001 Gujarat earthquake in India and the “Katrina Cottages” built following the 2005 Hurricane Katrina (United States) provide further examples where materials and/or semi-permanent structures were provided to residents to gradually rebuild their homes (box 2). This process, however, needs to be carefully monitored to ensure that residents rebuild according to safer standards and do not settle on disputed land.

A relatively unanticipated challenge to the general recovery and reconstruction has been the vast quantity of debris left by the tsunami. Collecting and disposing of such a large amount of debris requires time, large spaces, and resources—impeding other aspects of recovery.

LESSONS

- As discussed in this note, the GEJE experience demonstrates the importance of providing **multiple options for transitional shelter**. It also shows the importance of allowing local governments and affected communities to have a voice in the location, type, and services provided. This leads to flexible housing solutions that better match the needs of residents. Table 1 summarizes some of the advantages and disadvantages of the various types of transitional shelter, based on the GEJE as well as international experience.
- The design of the transitional shelter was built upon **experiences with past disaster recovery** in Japan. In Kobe a great deal of temporary housing was constructed far from the city center and former neighborhoods, with residency determined by a lottery system. These conditions exacerbated the feeling of loss for affected

BOX 2: International examples of creative, temporary-to-permanent housing



The “roof first” concept of temporary shelter was adopted in Yogyakarta following the Central Java Earthquake (2006). It prioritized putting a roof over the heads of residents, who could then incrementally finish the structure. For permanent housing recovery, a core house was used to provide a structurally safe permanent shelter as soon as possible for a large number of beneficiaries, who could then expand their housing incrementally over time.

Source: IFRC

TABLE 1: Transitional shelter options compared

<i>Type</i>	<i>Advantages</i>	<i>Disadvantages</i>
Temporary housing (prefabricated)	<ul style="list-style-type: none"> • Standard specifications • Can be built in large quantities offsite • Easy to keep track of relocated people • Can be used for collective relocation (preserving social networks) 	<ul style="list-style-type: none"> • Requires available, safe, and undisputed land • Slower relocation than rental units (needs to be constructed) • Low quality and lack of comfort • Often built in inconvenient locations, far from original homes • If use is prolonged, risks degrading to a slum
Temporary housing (owner built)	<ul style="list-style-type: none"> • Can evolve to permanent housing • Flexibility in location, materials, style 	<ul style="list-style-type: none"> • Requires available, safe, and undisputed land • Principles of building back better (or in nonrisk areas) may not be followed
Private rental housing	<ul style="list-style-type: none"> • Cheaper • Fast relocation (already constructed) • Flexibility and comfort 	<ul style="list-style-type: none"> • May not exist in affected areas • Relocated people are scattered difficult to keep track and provide services • Can reinforce social isolation
Public and government-owned housing	<ul style="list-style-type: none"> • Cheaper • Fast relocation • Comfort 	<ul style="list-style-type: none"> • Can reinforce social isolation • More difficult to preserve social networks and provide services than temporary housing

people, and there were many cases of “solitary deaths” (kodokushi), where no one even knew that the individual had passed away. The GEJE model tried to prevent this to a certain extent by promoting group relocation and preservation of improved social networks.

- **Community-based organizations** (such as *jichikai*) and **support groups** can play important roles in assisting affected people to understand and resolve issues by themselves during their stay at transitional shelters.
- The design of transitional shelters should be better from the start to promote efficient recovery—for example, by taking into consideration climate conditions and transportation and livelihood needs. It is also important to consider the **special needs of vulnerable groups**—including the elderly, children, and disabled. Transitional shelters need to be accessible to them, and complementary care services planned and provided. To facilitate this, local governments in highly vulnerable areas should **select a suitable construction site for temporary housing and coordinate the works and services needed before a disaster occurs**. Neighborhood groups should also be trained in network relocation.
- A better **information database of disaster survivors** is necessary in order to provide suitable support to the affected population. For example, such data can help in the planning of how many houses to build as affected people move out of the area into surrounding cities, as well as help forecast demographic changes over the long term. This information is also critical for more efficient and economic reconstruction planning.

RECOMMENDATIONS FOR DEVELOPING COUNTRIES

- The **timeline** and **costs** of transitional shelter must be considered carefully. In developing countries, affected people often start rebuilding their homes immediately after a disaster, and often according to poor safety standards. As such, transitional shelters may not be needed for long periods (as was the case during the 2010 Pakistan floods), and resources should be shifted toward permanent reconstruction.
- Long periods in transitional shelters may also make it more difficult for beneficiaries to move to permanent housing (such as in the Marmara earthquake, Turkey) and encourage the growth of slums or ghettos.
- In general, megadisasters in developing countries require transitional shelters that are **upgradeable, reusable, and recyclable**, allowing shelter materials to be gradually used for permanent housing. Salvageable materials from debris can often be used to build or complement shelters, and their salvage can be temporary a boost to local livelihoods.
- Owner-built shelters or units built with strong beneficiary participation are often best (for example, 2001 Gujarat, 2006 and 2008 Yogyakarta, and 2010 Haiti) but care must be taken to oversee the quality of the construction or provide incentives for better standards (such as conditional cash transfers). Cash or voucher programs,

such as used in Haiti (2010) and Wenchuan (2008), can promote flexible solutions and allow families to pool resources and rebuild together.

- Transitional shelters must be **planned together with strategies supporting daily life** (shopping, health care, social life, schools, infrastructure, psychosocial support) as well as livelihoods. To the extent possible, affected people themselves should participate actively in these services, helping rebuild a sense of community and a quick return to normalcy.
- The **location** of temporary housing is particularly important, especially where land is scarce. Sites with uncertain tenure should be consistently avoided. The preparation of a “land bank”—preselected areas that can be quickly converted to be used as transitional shelters or permanent relocation—should therefore be a critical component of any predisaster contingency plan in highly vulnerable areas. In places where public land is scarce, this may require that the government prenegotiate the use of the land with private landowners to prevent subsequent land speculation.
- To the extent possible, **the distance between transitional shelters and former homes should be minimized** to allow displaced people to maintain social networks and livelihoods, and protect their land and property.
- **Community cohesiveness** should be ensured by providing timing and site options for temporary shelter. This, however, requires high levels of government capacity and costs, and could slow down shelter transitions. Community members should provide one another mutual help.
- A systematic **communication and monitoring strategy** is critical to avoid harmful rumors, keep affected people informed, and allow for beneficiary feedback.
- Civil society and the private sector may not be robust and resilient enough to face the disaster, and may not have the necessary relations with their governments in some countries. In these countries, government initiatives are crucial.

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