Temporary housing after a natural disaster.

Can temporary housing becomes permanent ?

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1 Context

The 26th of December 2004, early in the morning, an earthquake measuring 9.2Mw struck Banda Aceh on the Indonesia coast. This quake took 128 000 lives and displaces a half million people. The 12th of January 2010, an earthquake touched Haiti with 7.0Mw catastrophe magnitude, and three million people were affected by the quake. The death count was estimated at 220 000 persons and more than thousands of people left homeless needed to be relocated. More recently, in 2011 in the Philippines, a flooding affected 338 000 people after 12 hours of continuous rain to Mindanao Island. These observations from The New York Time translate a climate change and the consequences on the population.

Defining a disaster remains a challenge. It's not only the result of a natural damage, it's also the consequence of an extrem population density, which create a vulnerability for the city. G. Lizarralde, C. Johnson et C. Davidson define the notion of « natural disaster » as an important perturbation in the community working or in a society and forcing the population to tackle by herself. However, the consequences touch human constructions which means the vulnerability of the city increases. The «United Nations International strategy for disaster reduction» talk about a community weakness in front of a risk related to chance. Because of

this effect, it is important to have a global strategy for the city. Indeed, the goal is to build housing by thinking with the disaster eventuality, that is, ensure the construction sustainability, to be able to rebuild quickly in a friendly environment to improve the lifestyle for future generations. Cities are getting vulnerable to a disaster because of a high density of population and a geographic localisation wich exposes to natural risks. Therefore, the priority is to build temporary houses in order to put families in a safe place to recover, which one they will call "home".

Temporary sheltering is employed accompanied by provision of food and health care. Because of the permanent housing construction can take few months or years, temporary housing has to be a safe place to recover a normal life as much as possible and allow the population to keep activities, an intimacy and a dignity. This construction is a challenge for architects, urbanists and for the government. It is the first "home" for people after tents, it is a protection but also a social help to encourage the population to recover and recreate a social network. Families can hopefully return to a semblance of normal daily living, albeit in a temporary place. A temporary neighbourhood is created quickly with shops, schools, whorshops etc. The time between the temporary construction and the permanent is a minimum of two years according to Cassidy Johnson. During this period, families take over the temporary neighbourhood because often they do not want to wait for the permanent. Some families prefer build by their own a house than to wait or to move in different places. However, if the city do not pay attention at this trend and if the government does not react quickly, the development of slums areas is a future risk. Housing reconstruction is one of the most challenging aspects of recovery, and the construction of temporary shelters does not have to be botched if the city wants to keep a chance to develop future neighbourhood. The period between the permanent houses and the temporary houses is strategic, and one of the issue about this transition may be :

How temporary housing could be developed to become a permanent shelter or a permanent house?

2 The possible ways from Temporary to Permanent housing.

This paper will present some issues and some reflections of studies made on the topic, which I consider relevant and will present the existing situation. This is a vast topic, for this essay a chronological analysis will be developed in order to understand what is happening before and after a disaster in terms of city development, community and construction management.

2.1 Before a disaster - Government Strategy

a. A strategic plan

It is necessary to anticipate population future needs and the short term time in order to design shelters with good qualities. Temporary houses are getting permanent because of the community place appropriation and because of the long time used by the government to take decisions. To avoid the development of slums because of a lack of knowledge regarding the two-way and multifaceted relation between disaster and urban settlement development, the government has to develop a strategy to anticipate a disaster. The creation of an emergency plan is important during the first period after a disaster because of the number of people in a precarious situation. In view of the extensive consequences, the priority is to keep the population safe and to anticipate some issues as : 1) the site where emergency shelters will be built, 2) economical aspects. If some decisions are taken earlier, the time to react is shorter and the authorities are more efficient to manage others needs.

Professionals in *Rebuilding after disaster* (G. Lizarralde, C. Johnson, C. Davidson, 2010) have pointed questions like : where would be the most appropriate site to receive a temporary project ? This question can be anticipated. They focus on two solutions : 1) rebuild close to the disaster, units can be individually dispersed on or near the property of the affected family to alow people to recover quickly and keep some facilities; 2) rebuild far from the disaster

like in countryside, with the possibility to build more thanks to the space, temporary houses can be clustered in mass housing ‘camps’ but with the disadvantage to be far from activities in the community.

When possible, it would be better if temporary houses are located on or near the family’s property. It would avoid disruptions for family members and allows them to use existing services and stay close to the former home, thus maintaining social networks. But this is not always possible. In urban area, families are living in apartments, the space is not enough nearby. If temporary houses are built in countryside, an important issue is the space, because moving the population increase the size of the city. Both of these propositions can be appropriate, depends the kind of disaster and the damages impact.

Cassidy Johnson (Planning for temporary housing, 2010), an urban development specialist, has an interest about urban shelter and the city vulnerability after a disaster, especially around Turkey. She proposed an organizational diagram about the strategy of the government and the decision process after a disaster. (Figure1) As we can read on it, the decision evolves all along the disaster process (before, during and after) with the context. If the strategy is unused the consequence is a waste of time and a late reaction after the disaster.In case of the strategy is appropriate the decision process is reduced.

An other analysis from Christine Wamsler shows the link between the risk of disaster and the poor area. As a vicious circle, she explains how it is possible to integrate the risk management to a settlement program.(Figure 2) Indeed, poor areas are more vulnerable in front of a disaster, and after the tragedy they are getting poorer and they cannot improve their houses. The consequence is the creation of slums. If this vulnerability is integrated as soon as possible in the city planning, some initiatives could help to resist to a disaster and to improve the shelters.

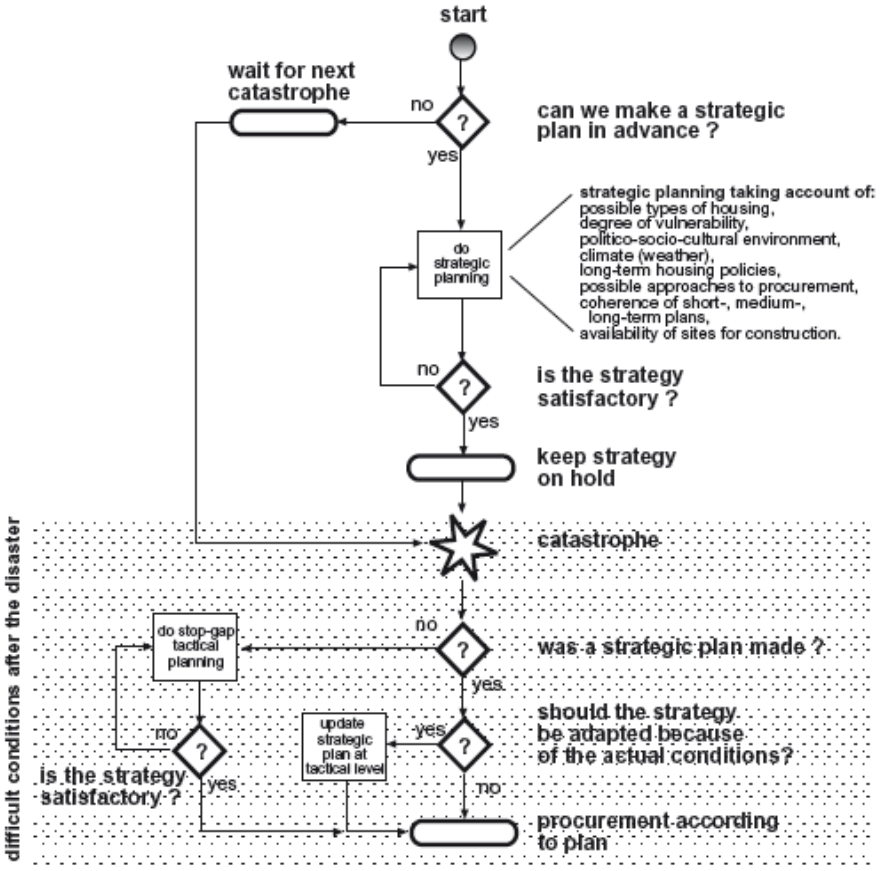

Figure1. Strategic planning for temporary housing is better done before the catastrophe strikes (adapted from Johnson).

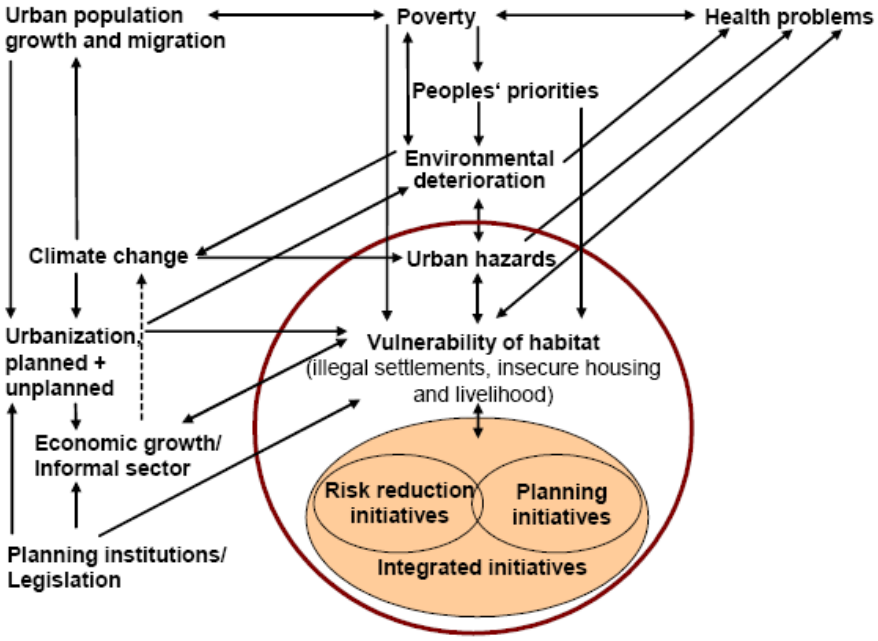

Figure2.The complex interplay between planning and the occurrence of disasters showing the potential of integrated risk reduction and planning initiatives.

b. The budget

The cost is an other factor that the government can anticipate. In fact, build temporary neighbourhood or permanent city town need an important investment.

A decision has to be taken to choose in which construction the government prefers invest. Ian Davis and Cassidy Johnson (Rebuilding after disaster, 2010) talk about two different ways to think on temporary emergency projects. 1) Ian Davis recommends to build as quick as possible permanent houses to avoid to have a heavy investment in the temporary construction which one needs a high cost. The second way of thinking from Cassidy Johnson recommends the opposite, 2) In his point of view, the construction of permanent housing needs a minimum of two years. In this case, it would be better to produce temporary housing with a high quality. This way, the investment would be used for the temporary shelters to help families to live in the same housing and the same area for a long term time than forcing them to move.

It is difficult to generalize, and any decision will have an impact on the future of families. Permanent housing requires knowledge, site understanding and analysis. People is going to reconstruct as soon as possible a network to live, and it is often in temporary shelters. Usually families improve the shelters, even if it is a temporary one, because they need to recover their life with activities. So they reconstruct school, shops, work in the unit, or laundry place in the neighbourhood. After a long period, it is getting difficult to relocate these families because they have a new life.

For example, in Colombia in 1999 after earthquakes in Armenia," the government was slow to build temporary housing, favouring instead an accelerated permanent reconstruction programme; however, within months, the hillsides were full of small wooden shacks that families had erected for themselves as temporary housing." (Rebuilding after disaster, 2010)

An earthquake in India the 26th of January 2001 measuring 7.7Mw damaged 1,2 million houses is 70% of the built environment destructions. The government launched a reconstruction program with loans from the World Bank and the Asian development Bank. They decide to repair houses to bring a normal life for the population as quick as possible, and to build new infrastructure with foundations for long-term disaster management and mitigation. In order to be efficient, a private/public partnership program has been set up between NGOs and the government to share the costs of housing reconstruction. Furthermore, they integrated the possibility for the population to participate in the program by voting. Therefore, families was allowed to build their houses and become owners. (Beyond Shelter, M. Aquilino, 2011) This example explains the relation between policy, package, and the performance of housing recovery.

Temporary housing cannot be a precarious shelter because people live inside for an unlimited time. The cost is high, but after, the challenge of permanent housing would be double : 1) to ensure the transition with the temporary and 2) give to the families a place to keep a life, a dignity and a security.

2.2 After a disaster - A second life of Temporary Housing.

a. Housing Bank

All temporary houses are not similar in terms of construction and materials. Depending of the site localization, if it is in countryside or in the city, if it is closed to the disaster or outside, if the investment is important or if they keep it for the permanent houses. Some differences in terms of cost, level of comfort and accompanying services : “Most importantly, temporary housing needs to be comfortable enough, with an adequate level of services, to enable people to live in dignity without ‘breaking the bank’” (G. Lizarralde, C. Johnson et C. Davidson, 2010). For them, two categories of temporary housing : 1) temporary housing that do not require new construction :

- Staying with family of friends, it is adequate for a short period because of the lack of privacy;
- Public facilities, families stay in public buildings that are retrofitted as lodgings, it is adequate for a short time because after few weeks it is getting difficult to move them or to reuse the buildings because of the family appropriation;
- rented flat, the government lease apartments to evacuate families, but the numbers of flats is limited.

2) The second category is temporary housing that require new construction :

- Self-built shelters, families build by themselves a shelter located in a public space, on vacant area or on the family's land. The risk of these shelters is the development of informal housing or slums. Therefore, families may stay outside of government assistance;
- in tents, it is quick and not expensive, depends the level of comfort. Families can stay in tents for an extend period, but it is mostly a wait time for a temporary shelter;
- in containers or in mobile homes; temporary housing units from the government built with prefabricated parts including sanitary and a kitchen.

b. Material Bank

It would be necessary to take in account due the weakness from the government, the fact that some families prefer to build their houses on their own than to wait for a formal unit. In order to avoid that, some solutions : 1) to reuse the temporary housing for another purpose. A steel structure can be easily reuse because it is light and flexible. But the costs is more important because it requires the transport and the assembly of the structure. 2) to recycle some parts for new uses. A wood structure can become the base for permanent houses, reusing doors, windows, fixtures, and structural pieces. In this way, the cost of permanent housing could be lower, and the population can take a part in the construction. 3) to keep the core of temporary housing to build permanent housing. Indeed, the possibility to add an extension to the house once families have recovered and once

they have resouces allows the population to expand the house to meet their needs and within their budget. They can create an entrance, veranda, a loft … But it means families are owner of the land. 4) Depends the strategy from the government, if the goal is to rebuild news housing, temporary housing can be collected to be refurbished and stored away ready for use in the next emergency, but the cost is high.

A good example of architect commitment in emergency constructions is Shigeru Ban's Paper Log House, deployed in Kobe, Japan, in 1995 as a post-earthquake shelter. He proposed a typology of temporary houses built with paper pipe, an economic shelter, sustainable with a light structure. He built houses in carton to help refugies with recycling materials from companies and work with the population. Thanks to the simplistic system, the population can easily take over the construction. Built on beer box fill by sand for the impermeability, carton pipes are linked gather with metal strand to create walls and supporting a framework with textile. Shigeru ban tried to change the mentality about temporary housing with this project, temporary doesn't mean dirty and miserable.

This example shows the will of this architect to act in the development of an emergency plan. Many parameters have to be taken into account in the design of temporary housing and in the strategy for the city. In each situation there are different priorities, but a guideline for an emergency situation would be developed. The government should be encourage initiatives from architects to develop shelters, because it is the reality for lot of countries and the architecture have a role to play. It is a challenge for the economy, for the people, for the city. In some place in the world, peole live, knowing that a disaster can happen. Architects can help to change the quality of the place to live in this country.

3 The Role of Architects

Archictects, planners, and urbansits have an important role in this issue. Even if the risk of disaster is uncontrollable, they have the possibility to help before with a preventive planning, and after with a post disaster planning. Their

role is not reduced to a natural disaster, in time of war or starvation their actions have to be efficient, practical, and quick. Before a disaster, when the government develops an emergency plan, the goal for the planner is to propose a global organisation of the city thinking about the management after the crisis and the population security. Architects have the responsibility for developing secure and sustainable settlements in order to change mentalities and to propose new constructions for the future generation.

Disaster increase in the world, Architects or urbanists specialised in emergency project could be one of the issue to compensate the vulnerability of the city and the poverty expansion. There is a lack of knowledge in this situation that explains the long-time to react. Few architects are specialised in emergency planning, and only a few have a real interest and are aware of the reality. Disaster after disaster, some countries are more touched, professionals could learn from the past, from the people. As a guideline for the city, a housing Bank and a material Bank from the government could be developed with rules to be more efficient. There are already fire codes, handicap access, and seismic building codes, we can guess a future specialisation in the emergency architecture with the development of Master Plans of cities in risk.

The participatory Planning could be an important factor. People could be an actor. The community is the first affected by the disaster, instead of to abandon them during the decision process, they can participate and be responsible of some missions in order to be closer to their needs. The risk education could have a part in the citizen’s life in order to develop population skills.

This problematic is large, and in a disaster situation all the community is affected. However, objectives never change, ensure the security for the population and try to be more and more efficient in terms of facilities. These goals are included in the Architecture’s role.

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