Improving fire resilience in informal settlements

Fire in an informal settlement in South Africa. (Mwelu/IRIN, 2008)

1. Introduction

The first cities were not planned, but in some way they formed a working city structure by trial and error. This is the way spontaneous settlements take form. Organic city structure is usually naturally dense and is by many experienced as nice and humane. Fire resilience is a big problem in informal settlements, partly because of the spatial layout of the settlements.

 The method of my investigation is to compare how we deal with and describe causes of major fires and fire protection strategies in typologies that have spatial similarities but different status. Therefore I have chosen to both read about fire prevention in informal settlements and urban areas with cultural heritage status. Can we learn something from how we have managed fire risks in older spontaneous cities and implement that in younger informal areas?

2. Literature Review

The international community has in recent years recognised informal settlements as a part of the urban world and that they are likely to grow in the coming years. Recognition has also been given to the informal settlements as an source of employment and economic growth. The 'right to the city' has been a perspective that has become more and more popular. The global tenure crisis can not be solved outside the informal society, so the solution must be integrated. (UN-Habitat, 2007 p. 134)

Today upgrading and regularization is a long process that involves restructuring both on a physical and juridical level (Mercado, Uzín 1996 p. 5). On-site upgrading and possibility of having security of tenure are seen as a better options than relocation and eviction which often create more problems than they solve when it comes to affordability, jobs and social problems. Access to economical, political and social assets is closely linked to disaster resilience, thus the supporting the social support networks is an important part of disaster prevention (UN-Habitat, 2007, p 164).

Climate change and rapid urbanisation have made the urban slums a hotspot for disaster risks, both man made and natural (UN-Habitat, 2007, p 163). The governments' failure to implement building standards is increasing the risk of hazardous events becoming unbearable to the society and becoming what we call a disaster (UN-Habitat, 2007, p 163). The urban density and complexity of infrastructure is also a risk factor where the poorer parts of cities are most at risk and the worlds one billion slum dwellers in dangerous locations are most vulnerable (UN-Habitat, 2007 p. 138, 170). 95% of the deaths in fire hazards are in low- and middle income countries and burn injuries are associated with low-income and informal settlements (John et al. 2017 p. 1-2).

Spatial typology and density is also a variable when it comes to disaster risk. However the risks may be reduced by follow-up on regulations, and by spatial planning. Especially in dense urban slum areas is the disaster risk high, but a grater inclusion of those at risk is a way forward. (UN-Habitat, 2007, p 165)

Most of the funding for disaster management is directed at reconstruction instead of risk reduction even though evidence is pointing towards big savings by working preventively. (UN-Habitat, 2007, p 165, 169) Protecting basic infrastructure and services is a way of preventing cascading synergy effects of disaster (UN-Habitat, 2007, p 165).

The increasing number of disaster casualties is connected to the increasing number of people living in cities (UN-Habitat, 2007, p 171). Cities are more vulnerable to natural and ma-made hazards because of their socio-economical and spatial layout; vulnerable groups live in more dangerous areas in cities due to lack of space and most of the world's megacities are located in hazard-prone areas (Gencer, 2013, p 10-12). The young, the elderly and the disabled are most vulnerable to disasters (UN-Habitat, 2007, p 181). Most human made disasters are found in Asia (UN-Habitat, 2007, p 174).

Fire is a man-made disaster. Due to a lack of adequate data collection, little is known about the incidence, impact and causes of fires in low-income and informal settlements in poorer countries (John et al. 2017, p 1). Fire hazard vulnerability in informal settlements has in many ways socio-economic causes, but is also a direct consequence of landscape characteristics of informal settlements. (Harte, Childs, Hastings, 2009, p. 143) The adaptive capacity in informal settlements is high and social networks play a large part in disaster response and recovery (Harte, Childs, Hastings, 2009, p 144).

In the case of the informal settlement Imizamo Yetu in Cape town, which suffered a severe fire event in 2004, researchers point out the lack of water infrastructure and the few maintained roads in the area as development challenges that increased the community's vulnerability (Harte, Childs, Hastings, 2009, p145-147). The built causes of fire in informal settlements, where the fires start and why they spread easily, are flammable building materials, high building density, lack of water and narrow alleys which hinder the fire services from bringing equipment (John et al. 2017 p. 1-2).

In cultural heritage sites (which share many features with informal settlements) fire protection is suggested to include both fire suppress systems, structural protection, fire separations, escape routes and use of less combustible materials (Marrion, 2016 p.749).

Structural factors of increasing fire risks in cultural heritage areas include narrow street widths, poor electrical installations and wall-sharing with adjacent buildings (Ferreira et al. 2016, p 739). In *Urban fire risk :evaluation and emergency planning*, a systematic method of fire risk assessment for old city centres is described. It focuses both on likelihood and propagation of fires, but not on the personal resourcefulness of the inhabitants as in Imizamo Yetu (Harte, Childs, Hastings, 2009).

3. Discussion

When I asked people in Manila some told me they had had earthquake training in school, but most of them did not know what to do in case of a major fire catastrophe. This goes against the argument of personal resourcefulness adressed in the article about the fire in Imizamo Yetu. You could argue that the urban poor in different parts of the world handle things differently, but I think that the basic human setting is similar in most poor and densely populated areas.

Many of my sources on informal settlement fires have focused on the social aspects of fire resilience. The question remains though, how can we adjust the built environment to improve the fire stamina? It is as if the built environment is not valued as a cultural asset. It is also evident that the focus of the literature about informal settlements is different than the literature about old city centers. What if we shift focus as a thought experiment from the poor people living in the slums to the built environment? One could argue that the different takes on safety mirror the different ways we look at built environment and its inhabitants.

Today it seems like there is a sharp line between a formalised area and an informal settlement with no grayscale in between. The formalisation process is long and extensive, including a massive replanning, analysing and rebuilding of most of the existing structures. This occupies a massive workforce for a long period of time. Though you could argue that all of these measures are needed to form a sustainable and worthy living condition for the urban poor, the sheer extent of the project and the will to do everything at the same time could contribute to the neglect of urban slums.

If there is a way to make the regulations and building codes more flexible, we can probably save lives and make life a little better for the greater masses, not just the ones selected for regularisation. The binary notion of safe or unsafe could be damaging to the possible processes of making the living environment safer step by step.

We cold make a difference if we introduce a fire resilience assessment protocol, which, like the methods for old cities, points out a grayscale of a community's resilience and specific weak points which could point out where to start if your means are limited. Flexibility should be a keyword in fire protection in all spontaneous settlements, not just cultural heritage sites.

4. Urban Shelter Design

In existing upgrading programs the spatial layout is planned according to the fire risks among many other aspects. Maybe there is a less invasive way of assessing risk and possibilities, by not doing everything at the same time. If we first deal with the things that directly threaten the life of people. We can, by focusing on obviously important issues, get the community to trust the good intentions of the regularisation project. I am not suggesting that security of tenure is a less important part of stable communities, but maybe we could build more sustainable cities if we saw securing communities as more of a grayscale and an ongoing project. It takes time for people to see why you should follow the building codes, even if it gets more expensive.

Can we handle fire risk where no other formal rules are followed? Maybe it is a good starting point for the process of changing peoples mindset about the governmental guidelines.

5. The Role of Architects

The architect is often used to taking a lot of responsibility for the security and implementation of a project. When working with people in another part of the world and in another socio-economic group, it is easy to get carried way by all the help you want to provide. In these instances it is important to take one step back and see what you can do and what the community can do for itself. The risk is always to become a neo-colonial force, thus making situations worse by stripping people of their autonomy.

The thing we can do is to try to compare our strategies for different built structures, find similarities, implement fire suitable resilience strategies and come up with new where the structures look like nothing we have seen before. The personal resourcefulness of the inhabitants should not be used as an argument, this carries on the tradition of underlying racism in international aid work.

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