

# Post-Disaster Housing Reconstruction

The community-driven approach in the recovery process, the case of the earthquake in Haiti, 2010.



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*"Give a man a fish and you feed him for a day;  
teach a man how to fish and you feed him for a lifetime".*  
Chinese Proverb



Picture 1. The commune of Petion Ville, Port-au-Prince

# I. Introduction

According to the IFRC (International Federation of Red Cross and Red Crescent Societies), a disaster is "*a sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources*". On average, 700 disasters arise each year on the earth and affect more than 200 million people. Due to climate change and the rapid growth of the population and urbanisation, disasters make more and more damages and aggravate the reconstruction needs. International aid operations mostly happen after the disaster struck and aim at providing emergency shelter, water and food supplies,... with the idea to "*Build back better*". However, the long-term challenge of recovery, such as supplying permanent shelter, rebuilding safe housing, or restoring livelihood, is often left behind. (David and Alexander, 2016)

Haiti, one of the poorest country in the world, has been struck by a massive earthquake (magnitude 7.0) the 12<sup>th</sup> of January 2010 that affected the whole country and killed 220'000 people and injured more than 300'000. The poverty was such that most of the country collapsed when the earth trembled. Around 300'000 houses were seriously damaged or destroyed and 1.5 millions of people were displaced. Before the earthquake, more than the half of the population lived under the poverty line. The country was facing a massive housing crisis, due to the lack of urban planning : around 86 % of the population lived in informal settlement; 90 % of the buildings of Port-au-Prince were poorly built and tightly-packed. The society was poorly organised, the political situation was vulnerable, the economy was in serious trouble and people were just recovering from the previous hurricane Hanna (2008) that affected 800'000 people. (Charlesworth and Ahmed, 2015).

There has been a failure in the resistance against the hazard, a failure to bounce back after the disaster and a failure in the adaptation in the recovery process. Haiti was poorly prepared and too little aware of the possible consequences of a disaster like an earthquake. A weak civil society, in combination with a lack of knowledge on how to recover, small economic resources, are reasons why the earthquake in 2010 has had such a huge impact.

Few days after the earthquake, a global emergency response provide support to Haïti through the delivery of food, water, medical aid, hygiene solutions, shelters, and basic non-food items (NFI's). This short-term response is highly necessary in the aftermath of a disaster in order to help affected communities to survive. The international community and the classical post disaster management are involved mostly in the immediate response to the emergency by saving lives through providing basic necessities to the affected population, without focusing on the risks and beforehand issues, and on the ability that the communities and societies have to recover themselves.

The transition for long-term recovery is a long process and post-disaster context is facing many issues, such as the social reality, the political situation, the lack of access and many logistical issues, inadequate human resources, a coordination and an organisation between all the actors overtaken, the deficiency of community infrastructure and service, etc.

In this paper, I will discuss the reconstruction of safe housing after a disaster and the significance to involve the community in the process of reconstruction to provide an efficient post-disaster response corresponding to the needs of the beneficiaries.

## II. Literature Review

### II.1 URBANIZATION PROCESS

Due to the rapid world population growth, a massive exodus from rural areas to cities happened and created a massive urbanization of cities. The population of larges town increased rapidly, affecting the density of people and the issues of housings for everybody. The main reason why people moved to cities was not to find a better housing but it was, and still is, for better job opportunities. "*Cities, since the beginning of Time, have embodied the dreams and aspirations of a society.*" And "*grappling with our cities, we seem to have become overwhelmed by the sheer dimensions of the problem, by the number of squatters, by the shortages of water, and so forth.*" This affected the low-income families and resulted in a urban poverty growth, where "*the poor are forced to live wherever*

*they can - on city pavements, in squatter settlements, or in overcrowded slums."*  
(Correa, 1999)

As said in a report of UN-Habitat, "*Urbanization and development*", housing is the link between every single human being and the social environment and is the place "*where successive generations find shelter to keep healthy, develop, socialize, be educated and prepared for fulfilling adult lives. In this sense, housing speaks to every dimension of personal human development, hopefully generating a double sense of identity and social belonging.*"

Actually, one in eight persons across the world live in informal settlement with poor human conditions and without any suitable access to basic services or appropriate infrastructure.

UN-Habitat define slum household as "*an area that combines, to various extents, the following characteristics : inadequate access to safe water, inadequate access to sanitation and infrastructure, poor structural quality of housing, overcrowding and lack of sufficient area, insecure residential status.*" (Lecture Ivette Arroyo, 2018).

These informal settlements are often "*the products of failed policies, poor governance, corruption, inappropriate regulation, dysfunctional land markets, unresponsive financial systems and a lack of political will.*" Improving the life in these informal settlements has been identified as one of the fundamental steps to end poverty. Haiti, where 86 % of the capital population lived in slums before the earthquake, faced major issues to upgrade the living condition within the slums. "*It is important to create an inclusive environment that encourages the commitment of the authorities and the engagement of the concerned communities to enhance a better understanding of the slum challenge.*" UN-Habitat proposed a strategy to resolve this housing crisis to "*put housing at the centre of the new urban agenda*", (called "Participatory slum upgrading programme"). "*With rapid population growth, high levels of poverty and pervasive urban inequality; it is evident that housing is inseparable from urbanization and should be a socioeconomic imperative*".

## II.2 NATURAL DISASTER

Today, natural disasters have been recognized as a threat against sustainable development and to a reduction of poverty. Many literature studies have covered post-disaster recovery and reconstruction.

Ian Davis, an architect and expert in post-disaster shelter and reconstruction, published many different books, reports and guidelines for many different international organisations and in his book "*Recovery from Disaster*", co-written with David Alexander, they have developed one theory of disaster recovery.

The process of recovery could be split in 5 different sectors. (see Fig 1) The sector "*physical recovery*" is a timeline of the recovery progress starting with the disaster and which is a combination of four vital elements, which are necessary to succeed.

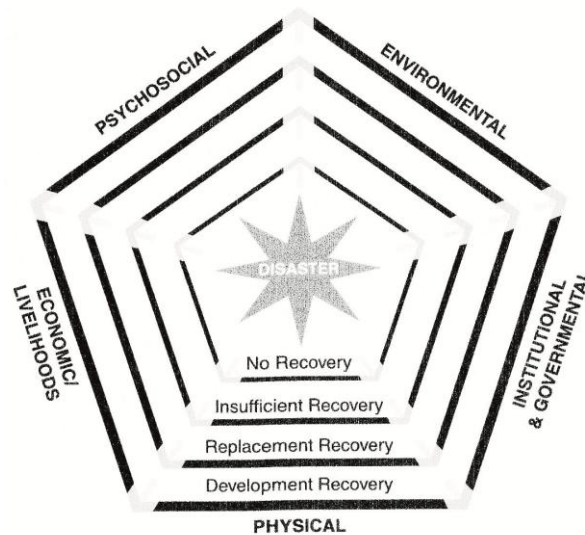


Fig. 1, Recovery sector (I. Davis)

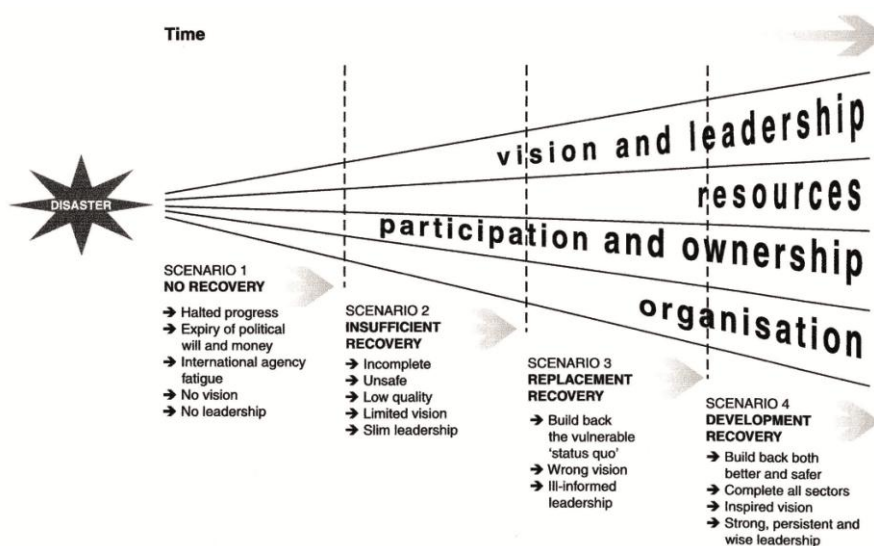


Fig 2. Progress with recovery (I. Davis)

*"Without **vision and leadership**, recovery is likely to drift into gross inefficiency or stagnation. (...) Without political, financial, material or human **resources**, nothing substantial can be created. Without **participation**, affected residents and stakeholders will certainly have no sense of **ownership** of the reconstructed environment. Finally, without **organisation**, recovery will be erratic, piecemeal and wasteful."*

These different elements are the key for a sustainable and effective recovery, which can follow four different scenarios, from the worst where there is no recovery to the last where the development of society is best off. (Fig 2). The situation in Haïti after the 2010 earthquake had followed the scenario 2 of *"insufficient recovery"*. The society was fragmented, faced plenty of challenges in repairing damaged buildings and infrastructures and was rather unsuccessful in launching the economy growth. To compare the case of Haïti in 2010, an earthquake also occurred in Chile however the consequences and impact differed enormously : in Chile, 526 people died against 220'000 in Haïti, despite the fact that Chilean earthquake had a 8.2 magnitude on the Richter scale.

Davis explains the different phases of the post-disaster responses, including the sequence of tasks with the focus on the intervention and recovery. The first step is the *"emergency responses to impact"*, followed by the *"recovery of essential services"* and finally the *"reconstruction"*. Nevertheless, the *"emergency intervention is usually a fairly transient process ; reconstruction is, in many cases, long-drawn-out"*, because the whole country need to cope with the devastating impact of a natural disaster, in addition to the many local issues they are facing, as well as that the immediate emergency response on an international level is phasing out. The reconstruction phase is a long-term process and include the reconstruction of permanent, sustainable and safer housing and require the involvement of the affected population. The user-build approach can *"lead to sustainable settlements and be an active expression of development. It fosters the active participation of surviving communities, mobilises communities and develops buildings skills, which in turn creates livelihood"*. (Davis and Alexander, 2016)

For Haiti, the massive damages of the earthquake were the direct consequence of the country's high vulnerability. The lack of community infrastructure and services after the disaster has required *"to use physical reconstruction as a process of integrating housing and community infrastructure and as a means of addressing a wide range of social and economic issues, beyond only building houses."* Different projects, led by international agencies, contributed in the process of reconstruction but the need of rapid shelters made that they used one third of the reconstruction budget for the transitional shelter and not much money was left for the long-term period of reconstruction. (Charlesworth and Ahmed, 2015)

### II.3 THE COMMUNITY PARTICIPATION

The post-disaster intervention must not be only limited to international agencies but should include all the parties concerned by the disaster (such as national and local agencies, the inhabitants and survivors). The participative approach strengthens a better development and stimulates the recovery period and reduces the dependence of the community. It resorts to cultural values, local habits and insures the sustainability of the development. In term of housing, the participation approach allows a family to control their own space, to design their dwelling, to use materials they want and to implement the construction. (Mechkat and Sarem-Kalali, 2016).

As the report from the World Bank *"Safer Homes, stronger Communities"* said, it is necessary to have a complete reconstruction policy focused on the vulnerable, which *"helps to reactivate communities and empowers people to rebuild their housing, their lives and livelihood"*. The communities must be empowered and partners into the policy of recovery so they can *"start and carry out the reconstruction that allows them to realize their aspiration, answer to their own needs and contribute to their own skills and knowledge"*.

To contribute to the effect on a long-term development, the reconstruction must be sustainable. *"Sustainability has many facets. Environmental sustainability requires addressing the impact of the disaster and the reconstruction process itself on the local environment. (...) Economic sustainability requires that*



*reconstruction is equitable and that livelihoods are restored. (...) Institutional sustainability means ensuring that local institutions emerge from reconstruction with the capability to maintain the reconstructed infrastructure and to pursue long-term disaster risk reduction."*

The case of Villa Rosa, an informal area in Port-au-Prince (Haiti) that has been 60 % destroyed by the earthquake, is an example of post-disaster reconstruction and community redevelopment program. They had the *"opportunity to develop and implement a community-based redevelopment and housing plan."* This project was a community-based owner driven reconstruction process that supported the development of local capacities and knowledge. The construction was supervised by "Build Change" staff (international organisation specialised in earthquake-resistant construction) but with the intention to use the local and affected communities contribution with the aim to train them. The people haven't just received a house but they were involved in the design and the construction of the house, where they gained skills in the process. *"This process allowed beneficiaries to control the quality of materials to their satisfaction and technical support by "Build Change" ensured further construction quality control"*.

This owner-driven approach, where *"beneficiaries were involved in the design, cost estimation and directly in the reconstruction works while material and financial support were provided to them"*, is beneficial for the communities. Their engagement give them a sense of satisfaction and ownership and that's affect the construction quality. *"Local capacities were strengthened through employment opportunities"*. (Ade Bilau, Witt, Lill, 2015).

## II.4 THE RESILIENCE OF THE COMMUNITY

Furthermore, disaster risk reduction and the diminution of vulnerability must be taken into consideration and be a part of the national policies in order to improve the conditions for effective and efficient hazard mitigation. This is a part of the concept of resilience, define as *"an ability to recover quickly from or adjust easily to misfortune, change or disturbance"*, or as *"the capacity of a system, community or society to resist or change in order that it may obtain an acceptable level in functioning and structure"*. (UNISDR,2002)



The resilience post-disaster gives opportunity for change and adaptation for the community with the intention to recover and develop in better conditions. Davis gives the characteristics of resilience after disaster such as to integrate recovery plan and reconstruction strategy or to take actions to reduce future vulnerability but what interests us the most is that it is important *"to recognise the value of a prepared community who knows what to do to recover"* and that a resilient society *"will recognise the importance of embarking on physical reconstruction"* and follows the approach to *"draw on support of their community by being adaptable, flexible and patient"*. (Davis and Alexander, 2016)

### III. Argument, Critique or Discussion

#### III.1 ABOUT URBANISATION PROCESS

As shown in the literature review part, the world's population is growing especially in southern and developing countries. The urban population is increasing, which explains a concentration of people and high density level in areas where life conditions aren't sufficient for everyone. With climate change, the number of natural disasters being on the rise and affecting more and more people, more often in developing countries where the poverty and housing situations are already in troubles.

#### III.2 THE EFFECTS OF A DISASTER

When a disaster arises, everything is destroyed, stopped, broken, interrupted,... the whole country is shattered, there are lots of casualties, economy losses, buildings collapses,... The emergency response phase starts, followed by the recovery phase, while the country and its society are facing lots of challenges. The whole country must be repaired, the housing crisis must be solved quickly, the economy need to be re-established,... But this whole process need to be coordinated and organised with the aim of it being efficient, quick and foremost sustainable.

I think that humanitarian aid is necessary because after a disaster struck, the needs are incredibly high, the local capacities are often limited or completely damaged and without any organised internal or external helps, the country risks to be more endangered than ever. They are essential to help the affected population to survive by providing food, clean water, medical supplies, new shelters, ad-hoc infrastructures,... However, in some case the immediate emergency response can be defined by its temporary character and they tend to act more on the effects of the disaster than on the causes itself, without a long-term investment. They insure mostly direct and temporary solutions in order to save lives, such as for example temporary shelter and other basic necessities. A suitable framework must be established to ensure the reconstruction of sustainable and safe housings and to provide affected population with disaster risk reduction strategies in order to reduce their future vulnerabilities.

### III.3 THE COMMUNITY AS A DRIVING FORCE FOR RECOVERY

Although the affected society needs to see further than this emergency phase. In a way to be more resilient, I believe the only way to be successful and help at best the affected communities is to involve them in the process of recovery.

The local capacity and the participation of the community is the key to ensuring the needs of the beneficiaries. The presented fragility and instability of the society influence the recovery from a disaster. I think to ensure an owner-driven approach with the direct participation of the community and under expert monitoring is a way to empower the local capacities, to offer new employment opportunities and to promote a sustainable development of the society.

As Ian Davis said, the affected communities need in the recovery process to have some resources, vision and leadership, organisation and participation and ownership. An affected population can greatly benefit from support in resources and organisation but the participation is the key for an effective reconstruction once the population is involved and empowered. They can be a real actor in their reconstruction process, decide for the design, participate in the reconstruction or the improvement of their houses. They might not have the knowledge, resources or capacity to build safer and solid housing however they best know their own needs, their way of life, their own cultures,... I think bringing new and complete

kits, that can fix everywhere, is not a sustainable solution. Involving population and using the owner driven approach are opportunities to many people to earn some money in order to develop livelihood and productivity, or receive knowledge and education about resistant techniques reconstruction to avoid vulnerable buildings. These ideas ensure autonomy of the community and an efficient and long-term development.

To apply some approaches based on promotion of local resources can revitalise productivity, stimulate self-help construction and self-employment, establish some construction standards, provide access to sufficient financial resources and be a solution to personalise the housing.

Moreover, in many countries affected by disaster, the community spirit is something essential. The power of community and solidarity is so powerful that people could refuse to leave or move in some new houses because it doesn't correspond to their needs or they would be away from their community.

## IV. Urban Shelter Design

### IV.1 PLANNING PRINCIPLES

Based on the discussion, many proposals can contribute to the recovery process. The society must have a clear vision for recovery. Shared coordination and an organisational structure including all the actors and guidelines and policies is a solution to tackle the reconstruction as a whole. It would be important to define the high-risk areas and to elaborate the land use strategy. For example, creating a masterplan for a reconstruction area can avoid the "on-the-job" construction and a future overpopulation.

### IV.2 EARTHQUAKE-RESISTANT RECONSTRUCTION

In a way to be more resilient and reduce vulnerability, the community should develop techniques for earthquake-resistant houses and improve the quality of housing. For the reconstruction of Haiti, in 2012, the government, NGOs and

international agencies had provided 5'189 housings units, while the residents themselves had built 50'000 without external assistance but unfortunately a large number of them were insecure and vulnerable. (David and Alexander, 2016)

However, a solution to prevent this informal construction could be to use some construction professionals, with technical competences, that could teach, train and supervise the population to transmit the knowledge and avoid the spontaneous and vulnerable reconstruction.

#### IV.3 USE OF RESISTANT MATERIALS

Often the issue is that population use poor quality materials or recycled rubbles from the destruction and try to assemble it, because, following a disaster, the prices have been increased due to the shortage of building materials. A more resistant material should be provided to build safer, such as concrete structure or metal frame and avoid plastic panel or fragile timber structure. Very often, the buildings collapsed because of the lack of proper buildings elements, such as foundations, structural frames (columns and beams), walls and roof. They lacked some elements due to financial shortage, affecting the structure of the house. Building good-quality frame with beams or reinforced concrete is necessary to reduce the impact of a next disaster and this is something that could be taught using participatory approaches.

#### IV.4 THE QUESTION OF TRANSITIONAL SHELTER

Moreover, to achieve an efficient and sustainable development for the disaster area, it would be interesting to focus on how temporary-transitional shelter (T-shelter) could be transformed into a permanent shelter. Because a lot of money, time and land are used with T-shelter but often they can't be adapted in a long term housing and they are destroyed. Furthermore some available sites for permanent housing shouldn't be blocked with transitional dwellings, if of course the local conditions allow it. But I think it would be beneficial to build as soon as possible the permanent dwelling, where the community could develop and provide their own adaptable, climatically and culturally appropriate housing.

## V. The Role of Architects

Architects have a major role in the process of post-disaster reconstruction. An architect is someone who uses creation and imagination to design spaces, housings, buildings,... and answers to the beneficiaries needs. And in a post-disaster time, they have the power and chance to directly help the affected people and provide them with new shelter.. Engaging with affected communities and using the participatory approach is key to success. Architects can bring knowledge, construction skills, funds,.. however it requires to exchange and actually first understand the local lifestyle, the culture, the traditional ways to build,.. They give the possibility and variation in the housings design, and allow some adaptations or extension to improve living conditions.

The role of architects is as well to develop the community infrastructure in a way to receive validation from locals, and provide new urban spaces, such as playground, basketball court, meeting place,.. These common infrastructures are necessary and benefit the whole community.

Once again, architects and the local communities that are affected must collaborate together to develop and recover in the disaster area. By training the local people, local builders and construction workers, we can expect that the capacity to build disaster resilient housings remains in the community.

I think architects can achieve the idea of driving the owner-driven approach, which means people from a community do not just receive a house, but that they are involved in the design and construction of that house and where they can acquire skills in the process.

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Pictures :

- Figure 1 :  
<https://i.pinimg.com/originals/92/24/82/92248284fe90daa0dfa8baca2b8904ea.jpg>