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MECHES HOUSE: THE IMPORTANCE OF CHOOSING THE RIGHT BENEFICIARY ON A POST DISASTER ALTERNATIVE CONSTRUCTION

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More than a year ago, Ecuador suffered a 7.8 M_w Earthquake that was devastating, the automatic response was to rush to the affected areas and rebuild. Meche´s House is an alternative: the crisis as an opportunity to experiment and consolidate popular construction systems based on an endogenous and holistic approach. This study evaluates two different methodologies (*Mutualista Pichincha´s Casa Lista* and Meche´s House) of the selection process for the beneficiaries on a reconstruction post-disaster building program contrasting each case and its needs by analyzing its approaches to the reconstruction procedures: one automatic, non-reflexive and product-based, and one analytic and process-based. Founded on experience and how different processes need different beneficiaries this study will raise some questions about the effectiveness, pros, cons, and perspectives of different approaches to make the correct choice of beneficiary for the reconstruction process after a natural disaster.

Keywords: Ecuador, Earthquake, Resiliency, Endogenous.

1 INTRODUCTION

This study deals with the importance of choosing the adequate beneficiary for a post-disaster construction process. Based on the values of the process and on the social impact in addition to the building itself, we will show the Ecuadorian seismic reality and different approaches for the reconstruction process and how those require different types of beneficiaries and how it affects their lives and their communities.

Ecuador is in constant seismic danger because of its geographical location in the Pacific ring of fire. According to reports; since 1541, there have been 37 major earthquakes, the majority of great magnitude as stated by Sánchez and Limón (2017) On April 16 of 2017, a 7.8 M_w magnitude earthquake hit the coast of Ecuador. The consequences were devastating, 70 % of real estate in the area was destroyed and according to the National Secretariat of Planning and Development (SENPLADES), 13,962 urban and 15,962 rural houses were demolished. Beyond numbers, a lack of technical advice in Ecuador is evident. This fact put in evidence another important issue: over 70% of the buildings that collapsed were built with materials such as concrete, steel, concrete block while most of the buildings that were left standing were made with local construction techniques, such as wood, and bamboo. After his first visits to the affected areas, President Rafael Correa admitted that many buildings collapsed “because of bad construction” Zibell (2016).

Most of the buildings that collapsed were built with no technical support or cutting corners irresponsibly, poor use or misuse of steel, use of aggregates from the beach with high salt content. Several reasons led contractor and construction workers to build carelessly, one is corruption by trying to make a building less costly in order to have more income, and another is ignorance. The bottom line is construction workers adopt these mal-practices and tend to apply them in their own buildings.

An important fact is that "almost 70% of Latin-America is built informally. In Ecuador, 70% of the construction sector is built informally, and three million houses are poorly built" Inmediato (2011). This means that there is no technical support for the construction processes, and building knowledge is empirical, based on malpractice, leaving most of the population at risk.

This evidence puts professionals directly responsible for casualties of the disaster, either through malpractice or because we allow for these mal practices to persist. Evidently, after the disaster, there was going to be a rebuilding process, but as professionals, it would be highly irresponsible to perpetuate those same mistakes: technical malpractices, irresponsible knowledge, and technology transfer.

2 FINANCIAL INSTITUTION "READY MADE HOUSE - *CASA LISTA*"

After the earthquake, well-intentioned support from the government and many institutions was present in the reconstruction process. However, all plans were a massive and immediate answer, and what usually occurs during crisis, "the implicit assumption was that the beneficiaries (...) for the most part, were too backward to initiate development themselves and that local government would be responsible for taking the lead" Finsterbusch and Van Wicklin (1987). After the disaster, most of the reconstruction process was led by government-related organizations. The months after the earthquake hundreds of houses were built but only for those families that follow these organizations own requirements. Families such as Meche's were not able to receive a house. As for most of these cases the project values were: time and cost efficiency and political impact.

A renowned financial institution of Ecuador "*Mutualista Pichincha*" was one of the organizations that through the project *"Échale una mano a Ecuador*" – "Give a hand to Ecuador", built thousands of houses. Similar to many organizations, the requirements to become a beneficiary generally were:

- Ecuadorian citizens or foreigners with permanent residence in the area, of legal age, heads of an organized family nucleus. Single people without dependents and over 50 years.
- Owner receives the poverty stipend.
- The overall monthly income for the family is less than 1087.50 USD.
- Proof of ownership of land.
- Do not own any other house anywhere.
- The owned land must be leveled. *Mutualista Pichincha* will review the land which should be technically leveled and in risk free areas (flooding, landslides, etc.)

Most of these requirements are focused on the person or family itself rather than the impact that the project will have on the community and its construction knowledge. Although it is very important to analyze the circumstances of every specific construction project, the durability, the cost-effective variables or the speed of the construction. Every process needs a specific kind of beneficiary.

3 MECHE´S HOUSE

When the opportunity arrived for Ensusitio Arq[1] to rebuild in the disaster area, values were set to guide the decisions that would affect the development of the project.

- Conceiving the construction not as a product, but as a process for technology and knowledge transfer.
- There must be more people involved in this process than just the beneficiary and family.
- The beneficiary must provide a counterpart or contribution even if it is symbolic: a form of commitment.
- Knowledge transfer needs to be direct and without interference, no volunteers or architecture students. This fact may have led to a slower construction process but an emphasized communication with the beneficiary and its community.
- The beneficiary must be open to experimenting with local materials in order to produce accessible technology that can be replicated.
- The building must help to break the poverty cycle, making the home productive.

Meche, forty-one, is a single mother of five girls and a grandmother of two boys. She is the hairdresser of Pedro Carbo and an active member of the local Cacao Association. She lost her house in the earthquake, she started rebuilding with what was left of the house and lost what little was left in one of the replicas. Although need was evident and dramatic, she was not a candidate for government agencies or organizations as a possible beneficiary because her land was on a slope and all prototypes are for leveled sites.
In addition to the dramatic need, we decided to work with Meche because of:

- Commitment to experiment with local material and technology
- Her house-beauty parlor can be an example of how to break the poverty cycle.
- She was committed to invite interested members of the community in order to build her house in exchange for learning proper practices in construction techniques such as bamboo as structure and bahareque, known as wattle and daub, wall consisting of, bamboo strips coated with a sticky material that combines wet soil, clay, sand, animal dung and straw or fiber.
- Meche had already started her house on her own, by selling the livestock she had, she managed to complete a poured concrete foundation. This was the investment she could make, showing her commitment by selling her valued goods "Commitment can become tangible in the form of financial contribution." Finsterbusch and Van Wicklin (1987).

4 FINDINGS

As mentioned, one of our responsibilities as professionals must be to ensure best practices within the construction processes, in order "to have a proper analysis of each technology and its pertinence for each environment where it would be implemented; this means an appropriate technology transfer process where the product is not only the outcome but also the process itself" (Villacis *et al*. 2017). In other words, the building should not be only a building but a building process that would be a laboratory and workshop in order to ensure an adequate knowledge

[1] Ensusitio Arq: a workshop based in Quito-Ecuador, working with what is available IN ITS PLACE, following participatory and community consensus process for public, private and academic projects.

transfer. The participation of the beneficiary and neighbors in the process “builds a strong sense of community and encompasses benefits that span social, environmental, cultural, economic, and spiritual facets. Furthermore, an appropriate technology best fits with the community it serves because it is created by the people to meet a need. Therefore, the communities are placed at the center of decision making and create technologies that will best serve their communities in the long-term.” (Margolus *et al.* 2017). All the reconstruction processes must be thought as a long-term project where the knowledge acquired would transcend the mere house. Knowledge and "development imposed from outside the local setting, no matter how benevolent and well-intentioned, is ultimately counterproductive". Finsterbusch and Van Wicklin (1987), especially after a disaster because external and immediate help in reconstruction process could produce dependence.

By simple observation, the beneficiary selection process in several projects leads sometimes to fractured relationships within the community because of envy or despair, by having a portion of the community sharing the building process and being part of the knowledge transfer the social fabric within the community consolidates rather than dissolves. See Figure 1. This is another reason why choosing the right beneficiary is vital for the entire process.

Even though "projects should involve more participation by beneficiaries, in fact, some would argue that real development, by definition, must involve beneficiaries in their own improvement (e.g. Gran, 1983a, b)", we think not everyone is suited for this kind of process because it requires a great amount of responsibility, but on the other hand this responsibility can build a real impact within the community. Finsterbusch and Van Wicklin (1987) said, "Without participation, the people may benefit but not develop from a project. Thus, participation has intrinsic value".

Figure 1. M. Pichincha house exogenous technologies

Figure 2. Meche's house endogenous technologies

There are several ways to deal with a reconstruction process, but in order to educate responsible local construction workers and at the same time teach people to value their own potentials and local construction materials and technologies an endogenous strategy is needed. Informality in construction will continue once the effects of the earthquake are forgotten. The government should encourage the return to vernacular architecture, with materials from the region, instead of allowing dangerous constructions in concrete of several floors that do not comply with the adequate codes states Zibell (2016). Providing and sharing a construction process with local people and using local materials can ensure best knowledge transfer because "an effective project should transfer essential skills to the beneficiaries themselves where possible so that they can sustain the project after the implementing team has left or have greater capacity for other development tasks." Finsterbusch and Van Wicklin (1987).

Ecuador is not exempt from a future disaster so we considered that one way to deal with the reconstruction was to make the beneficiary an active participant. Thereby their resilience “refers

to the ability of human settlements to withstand and to recover quickly from any plausible hazards. Resilience against crises not only refers to reducing risks and damage from disasters (i.e. loss of lives and assets), but also the ability to quickly bounce back to a stable state" UNHabitat (2012), and reaction will be more effective, just because they would not be waiting for external help, charity, but they would be able to rebuild based on their local knowledge and resources: thus the reconstruction process becomes a resilience workshop.

Table 1. Building technologies comparison,

BUILDING EXOGENOUS / ENGOGENOUS TECHNOLOGIES		
	M. PICHINCHA HOUSE	MECHE'S HOUSE
FLOOR	concrete	local wood
STRUCTURE	metal	*guadua* cane (bamboo)
WALLS	prefabricated concrete	*guadua* + soil
ROOF	asbestos cement	metallic

Table 2. Cost and m^2 comparison.

	M. PICHINCHA HOUSE	MECHE'S HOUSE
COST / M2	$ 200	$ 169,50
M2	56	76
N. ROOMS	3	3
TOTAL COST	$11 200	$12 882
CON. TIME	100 units -1 month	1 unit - 9 months

Figure 3. *Mutualista Pichincha* house beneficiaries

Figure 4. Meche's house beneficiaries

5 CONCLUSIONS

- During the selection process for Meche´s House, the decision making was not only the responsibility of the technical team, but also the community, cacao cooperatives, and Pedro Carbo residents had a strong opinion to share. They were conscious of the responsibility and future impact of the project. From the earliest steps of the project this house was not only seen as a house but a living example of good practice for local construction technology catalog and a model of resilience and poverty cycle breaker. Everyone in the process is conscious of the demanding requirements for becoming a beneficiary of this. We consider that providing and sharing a construction process with local people and local material can ensure the best knowledge transfer. When dealing with possible future disasters their resilience capability and reaction will be more

effective, because they will not be waiting for external help, charity, but they will be able to rebuild based on their acquired knowledge and resources.

- The beneficiary selection process form the "*Casa Lista"* is far more generic and its needs are based on time efficient products, focused on solving the crisis needs of numbers of people served. These variables are understandable, especially when this process has to face political cycles: cost and time effectiveness.

As a popular Latin American saying goes, *"quien quiere celeste que le cueste"* if you want something priceless much effort has to be put into it. This process has a possible high impact within the community behavior, and that is the reason why a very conscious and careful decision making is important not only to assure commitment but also make a political impact in the community.

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