Humanitarian’ or; ‘Resilient Architecture’ for vulnerable communities?

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Abstract

Besides their singular urban and cultural realities, in regard to rebuilding and development programs the rapidly growing cities of the Portuguese Speaking Countries Community (CPLP) seem to deal with similar challenges. Despite Portuguese alignment with international guides to reduce vulnerability and building communities’ resilience to natural hazards, little attention has been paid to these issues within the bilateral framework for cooperation.

This paper focuses a reframing of the architectural practice developed in humanitarian context; it tries to bridge the specific gaps between architects, humanitarians and developers working within vulnerable communities. Ultimately, it aims at applying this knowledge to the CPLP.

Embracing the action-research method uses the data collected from and progress with the field work done by the project Sustainable Urban Renewal: Energy Efficient Building for Africa (SURE Africa) and Portuguese-based-NGO Building 4Humanity.

Adopting a trans-disciplinary approach, it incorporates ‘humanitarian architecture’ with resilience and social innovation features such as the emphasis on connecting people, resources and ideas, eco-efficiency, empowerment and communities' engagement in design. To improve the dialogue between ‘humanitarians’, ‘designers’ and householders, research explores translational tools, namely mapping, web-based platforms for co-design and tools for building resilience.

The analysis undertaken suggests that trans-disciplinary and intercultural dialogue play a crucial role in the process of assisting local leaders and households to (re) build on community assets and internal capacities, introducing ‘eco’-efficiency solutions without mischaracterizing traditional settlements and architectural knowledge and caring about previous lifestyles and livelihoods.

Keywords: humanitarian architecture, resilience, social innovation, eco-efficiency, Africa
INTRODUCTION

State members of the Portuguese Speaking Countries Community (CPLP) such as S.Tomé e Principe, Cabo Verde, Guiné-Bissau, Angola and Mozambique, Brazil and Timor-East seem to deal with similar shortages and risky circumstances when it comes to informal settlements, which are characteristically present in the peripheral and sometimes even central areas of their major and rapidly growing cities. In these slum areas the relationship between disasters and development is of much greater magnitude due to the high vulnerability of people and houses. [1]

Corresponding to the impact of disasters, conflicts and extremely poverty issues, NGO’s present in the field are mostly specialised in emergency response, and just a few of them have been dedicated to (re) building employing a long-term developmental perspective. As a result of that, there is a significant lack of planning, design and enduring action, notably in vulnerable areas, such as the informal settlements. Thus, besides the need for urgent humanitarian aid, acting in favour of sustainable urbanism and architecture for informal settlement is necessary. By reducing disaster’s risks, promoting better building, retrofit, and rebuilding, it is possible to achieve a more substantial social impact.

Within the scope of analysis, synthesis and learning from local traditional and innovative attempted solutions, the current research will be looking at selected experiences on low-income housing and recovery. Ultimately, the aim is to apply lessons to the Portuguese-speaking countries community (CPLP), especially in Africa and in general in the global south, where Portuguese actually is the most spoken language. Particular attention will be given to the concept of incremental housing, which has proven to be effective throughout decades of slum upgrading operations based on self-help or aid-self help building.

OBJECTIVES/METHODOLOGY/SCOPE

Research should contribute to a better understanding of a few crucial points when comes to deal with several affected communities:

(1) Which is the role-played by architects and architecture in the post-disaster, namely in the aftermath, in the developmental phase and also in between the two phases?
(2) How many people are interested in the subject, what are the short and long terms architectural impacts, to what extent it matters, and, ultimately, does it really make a difference?

(3) What examples may confirm architectural impacts and the actual role played by designers working near humanitarians and low-income housing developers such as local communities, NGO's, and municipalities?

(4) How to involve the communities in design and building meaningful processes and how useful are classical tools, such as incremental housing, and social & ecological innovative tools, such as community-building, experiential learning, gender issues and creative thinking?

(5) How to educate, enable, empower and technically support people for disaster risk reduction and launch, in a community driven & oriented basis, design and building recovery, and developmental processes?

A first working hypothesis was that the more sustainable and resilient accomplishments occur when architects undertake a creative but also supporting role. A second hypothesis was that the dissemination of incremental housing design among householders, builders ad self-builders may respond to both emergency and long-term needs, allowing for effective urban form and building type controlled massive reconstruction and upgrading.

Summing up, the research goals are as following:

(1) Questioning the place occupied by architectural design practice and the role played by architects on rebuilding recovery processes addressed to very severely affected communities in the context of humanitarian aid (post-disaster rebuilding) and low-income housing (development contexts).

(2) Building up translation tools between humanitarians and architects, exploring common conceptual vocabulary, web-based digital mapping, computer aid design and interactive systems for re-generating building types.

(3) Incorporating the subject of humanitarian architecture into the architectural graduation curricula and outlining a post-graduate proposal with a focus on the CPLP geography.
(4) Although focused on how to better plan, design and rebuild in disaster-prone and informal settlement areas, investigation must also address education at different levels, ranging from children (formal and informal education for disaster risk reduction) to adults (long life learning), to students of university (particularly those enrolled in architectural, urban design or urban planning graduations).

(5) Bringing into the discussion of theory and practice of architecture, features and tools used in social innovation, towards a sustainable and trans-disciplinary architectural approach to be applied in the context of disaster and development.

(6) Making a contribution to the strengthening of cooperation amongst Portuguese-speaking countries in the areas of post-disaster rebuilding, disaster risk reduction, post-recovery assessment, informal settlement upgrading.

In terms of methods, the investigation undertakes the challenge of facing the theatre of humanitarian and developmental operations. Moreover, it brings together in humanitarian projects and surveys experts coming from different areas and with a diverse background, while working and alongside and within communities. Learning on the field, drawing near the residents and researching by project and by doing, designing and building in a local-resources-basis, requires a close relation with stakeholders. In a small scale and low profile NGO this relation with local communities may progress through remote communication; in the beginning, indirectly, via humanitarians on the field; afterwards, directly, thanks to internet technologies and social networks. Precisely, these interfaces of communication will be addressed in next stage through a web community-driven mapping collaborative tool for architectural models simulations. This technology is supposed to anticipate scenarios for rebuilding and incremental housing and risk reduction measures, while supporting the monitoring and assessment of long-term impacts of on-field actions. [2]

Keeping the focus on the Portuguese-speaking developing countries geography, research deals with an encompassing framework concerning (1) theory and practice, (2) planning and building, (3) the social and the environmental, (4) the ethical and the educational, (5) innovation and traditional knowledge.
The in-situ observation, interviewing and surveying embraces a genuine exchange and intercultural dialogue with residents; digital mapping and computer aid design tools assist and tries to advance this interaction while pursuing communities members empowerment on recovery, urban upgrading and housing issues. An action & research laboratory will be attempted by crossing information with on-going projects and research for African countries by Portuguese-based NGO Building 4 Humanity Design and Reconstructing Communities Association and also follow steps of the joint international project leaded by a Portuguese University, focusing on local building types and energy efficiency, the SURE Africa [3].

Leading with these trends through a interdisciplinary approach, joining architects, sociologists, psychologists, economists, engineers, ecologists, social service technicians and spiritual leaders, both practitioners and researchers, B4H tries to develop the concept of social innovation architecture. With this new approach B4H seeks to investigate participation models that strengthen the social and cultural component of sustainability of each of the operations in the field, assuming that ongoing social, economic and cultural transformations require a reconfiguration of the relationship between residents, technicians, institutions and administrations. [4]

Additionally, B4H started the process of empowerment of men and women to acquire greater levels of expertise in green construction or repair of buildings. In the developing of this task B4H is benefiting from the work developed in SURE-Africa project a European joint-venture project focused on the improvement of energy efficiency of vernacular houses leaded by the Higher Technical Institute (IST, Portugal) [3]. This project received contributions of the University of Cambridge (UK) and the University of Lund (Sweden) and was carried out in the field for three years within the involvement of local architecture schools such as the Agostinho Neto State University in Angola, and local communities. Energy and ventilation performance where checked by measurements of comfort levels in the interior of buildings and users' comfort perceptions testimonies [5]. Both analogical and digital methods were used, namely questionnaires and Ecotec software, a 3D building analysis and simulation program that integrate lighting, energy and environmental studies in order to visualize and increase sustainable design solutions [6].
Figure 1. Vernacular houses in Guiné-Bissau usually built with rammed earth or adobe walls and straw fiber roofs (above), recently replaced by zinc (below). Credits: The authors
DISCUSSION

In the 21st century, new developments in technology, notably in GIS, the consolidation of the environmental university programs and reshaping of geography and mathematic sciences enabled the incorporation of scholars from these areas, concomitantly contributing to widen the scope of post-disaster research. Thus, the new studies addressed risk and economic issues [7], social and cultural impacts, livelihoods, gender issues, minorities, social and cultural impacts, as well as in-depth investigations on participation models [8]. Additionally, in a gradually way, acquired importance the subject of the informal settlement, the place where came to live the majority of the most vulnerable people. Although covering an increasingly wide range of areas, it is noteworthy in recent studies, the lesser attention paid to architectural issues within the humanitarian context. As such, there is little evidence of Architecture exposure to other fields of research, just a few signs of trans-disciplinary investigations [9]. It is necessary to go back many decades to find an integration of architecture to services, infrastructures, economics and social dimensions, like the one proposed by the site and services projects (SSP, conducted by the World Bank in the seventies). [10]. In this matter, it is noteworthy the current interest in the trans-disciplinary concept of incremental housing, successfully implemented by Alejandro Aravena and Elemental group, in Chile [11]. This concept, both in research and practice, can be seen, at a certain extent, as a revision of the SSP. [12]. Recently, this concept has been approached by cutting-edge research focused on computer aid design-based automation software, with the goal of optimising mass housing design and (re) construction [13].

In the Portuguese-speaking countries arena, the inter-cooperation on urban research gave rise to studies that addressed peripheral non-infrastructured areas issues, highlighting social concerns and the right to the city, in Lefebvre terms. [14]. Singular cases in African countries, addressing thermic comfort and building performance of local houses through specific software simulation, showed the potential of cultural landscape and building type concepts in design thinking and within the field work of NGO’s near communities [15]. In addition, these examples, by emphasizing local
cultural idiosyncrasies thorough rituals and architecture revealed that build meet people needs, in Paul Oliver meaning, involves, at the same level, to meet physical, cultural and spiritual needs [16].

In accordance with the chief objective of enhancing lifestyles and livelihoods research tries to bridge architecture with other disciplines presents on the field of disaster recovery and development [17]. It argues that an architecture embedded in a trans-disciplinary approach is more likely to foster communities' participatory action, sustainability issues, and, ultimately, is more suitable to pursue a desired dynamic of social change. [18]

Fig. 1 The humanitarian architecture approach: a local-based multilevel, intercultural, trans-disciplinary and dialectic process that requires social innovation tools and involves diverse partners and members of the communities whose aspirations, ultimately, it will try to meet. (credits: A.Nuno Martins)

Additionally, innovative tools such as web collaborative digital community mapping tools and open source mobile applications for engaging community members in the process of DRR, recovery, resettlement and slum upgrading, might also be of great interest whenever they are assumed by local groups as part of their social agenda. This widened conceptual and instrumental lexicon is supposed to pervade architectural discourse and practice, thus contributing to filling the gaps between theory and practice, between humanitarians’ immediate focus and designers’ developmental visions. Ultimately, this upgrade of humanitarian architecture [19] fits the purpose of building translation tools for the necessary inter-sectorial dialogue among professionals.
The dialogue between researchers and professionals from the field may benefit from acknowledging of a common ground of interest. To this end, the research champions that social innovation might be this common ground from where to built up, possibly in a more consensual and fertile way, this dialogue between humanitarians and designers.

At this point, it is important to bear in mind that a trans-disciplinary approach must not overlap to the nature of the discipline of Architecture. In a rapidly and increasingly urbanised world, the role to be played by architects should never be underestimated if a consistent ‘humanitarian architecture’ is to be accomplished. To go beyond disciplinary boundaries and let related disciplines permeate architecture; to accomplish a trans-disciplinary approach is required. Rather than mitigating architectural identity and running the risk of turning it into a syncretistic field of knowledge, which it is not the case, this approach point to the full spectrum of architecture’s possibilities.

RESULTS

Both literature analysis and under progress operations of NGO Building 4Humanity point to the best methods of informing local leaders and households to rebuild and incrementally expand their houses, without mischaracterising traditional settlements and vernacular architectural knowledge and caring about previous lifestyles and livelihoods.

Also, from the interaction with stakeholders, it has emerged that the most resilient achievements occur when architects work as ‘cultivators’ and ‘facilitators’. In this sense, these on-going experiences corroborated literature, specifically, case studies that advocate that in the humanitarian field, to filling the gaps between theory and practice a new conceptual and instrumental lexical should infuse architectural discourse.

Initial results suggest, therefore, that a new commitment, a real shift in architectural practice within the humanitarian context is necessary to allow on-going innovative practice and thinking permeate architecture. Instead of undermining its credibility or diminishing its field of intervention, this cross-
disciplinary interaction, tend to consolidate architecture as a broader body of knowledge to where high kinds of knowledge converge to and amalgamate. But what will be the profile of this new humanitarian architecture?

Case studies reflecting on direct action-planning and building field experiences, whether in disaster or development context, provide valuable clues to devise a set of principles for a humanitarian and sustainable practice: (1) Prioritising local cultures, knowledge and resources; (2) paying attention to minorities, (3) investigating urban & architectural design and building strategies and also participation models that strengthen the social and cultural component of sustainability and community resilience, (4) incorporating into ‘humanitarian’ architecture intercultural and interdisciplinary dialogue, (5) integrate to practice digital and analogical tools for social innovation, (6) bring in findings of ground-breaking research and mainstream disruptive practices that attempts, not necessarily prioritized in this order, assertive concepts such as (i) system building type, (ii) incremental housing (iii) community resilience (iv) disaster risk reduction (v) women participation and leadership, (vi) cultural landscape preservation and valorisation (vii) cultural and social assets, (viii) well-being and quality of life.

The incorporation of digital mapping into the communities’ participation process as a strategy of inclusive citizenship and the delivery of GIS mapping and 3D simulation tools to be spread and patent registered will constitute one of the innovative elements and final outcomes of the research. This effort, still in progress, has been supported from its initial stage by ESRI-Portugal, the national supplier of ESRI-International solutions the world leader producers of GIS Technology with relevant experience on the area of disaster management, technical support, training, and product design. This partnership is supposed to generate, in the next three years, two different products, one non-profit, other commercial. The first is an online open source mapping application to be easily accessible to stakeholders through mobile technology. The second, a more sophisticated solution combining GIS mapping and 3D simulation tool, provide assistance to technician and developers from the private sector. Both solutions are supposed to expand the possibilities of transferring knowledge and data collection among Portuguese-speaking countries. These tools matter since they can contribute to improving practice and hence, influence housing policy.
The main finding of the SURE project confirmed the importance of design and communicating according to the dominant self-construction techniques. It also highlighted the relevance of meeting basic comfort needs using passives strategies. Final outcomes suggest energy conservation through passive building design as a proven equivalent to renewable energy power generation, emphasizing net demand reduction rather than production, an approach considered more compatible with traditional lifestyles and to the social-economic conditions of the majority of the population [3]. Otherwise, people will not be able to build the proposed solutions and will prompt to acquire and install air conditioning (if they can afford it). These cultural and social contexts suggest new ways of communication, addressing both native idiosyncrasies and knowledge, privileging hand drawing and local sources as, for example, oral tradition.

CONCLUSIONS

In Africa, the degradation of urban buildings, a housing deficit combined with a massive influx of poor rural people, unplanned urban growth and low comfort levels inside buildings, strongly impacting climatic agents such as high levels of solar radiation and air humidity, and torrential rainfall, challenge builders and architects to find sustainable ways of providing security, comfort, and economic satisfaction for the final building users. Raw materials, ancient techniques, such as earth walls, straw covered roofs, optimized orientation and natural ventilation are still available and may be potentiated by joint projects of academics, humanitarian associations and local communities that address empowerment of residents. Following the steps done in the field and strengthening SURE-Africa achievements in laboratory, B4H will identify and deeper characterize housing building types, analyse their comfort performances but also their cultural framework, and create an interdisciplinary approach, before propose strategies for sustainable design.

This shift in the current architectural practice into a definitive humanitarian architecture means to move from the dominant design-centred approach to drawing near social innovation issues regarding local housing recovery and development trough: (1) community oriented design of a local resources-based architecture or just enabling, perhaps capacitating stakeholders,
community-driven design, (2) urban cost-efficient and socially equal infra-structure lay-out, (3) land design subdivision towards open, green public and community spaces and private secure tenure, (4) local empowerment on building techniques, (5) assistance, facilitation, cultivation in self-help and aid self-help building. (6) Attention to correlative themes such as community involvement, land rights, local governance articulation, social business, minorities and gender [19].

ACKNOWLEDGEMENTS

Research Centre for Architecture, Urbanism and Design of the Faculty of Architecture, University of Lisbon (CIAUD/FAUL)
The Portuguese Foundation for Science and Technology
NGO Building 4Humanity Design and Reconstructing Communities Association

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Broadbent, University of Portsmouth, UK and C.A. Brebbia, Wessex Institute of Technology, UK


