Think Infrastructure: start with a wall A step-by-step low cost housing approach

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ABSTRACT

Housing is one of the basic necessities for human survival. The unpredictable nature of economic development and rapid population growth of most of the emerging countries makes effective and efficient housing delivery difficult for governments, leaving the right of their residents to housing unsatisfied. Creating affordable living spaces is seen as a political and economic issue, leading to discussions on economic measures to relieve it, but there are solutions offered by architects and urban planners, that take factors such as construction, density, land use, infrastructure into account. In this paper, the authors introduce a low-cost approach to housing in the context of developing countries, taking Ethiopia as a case study, with the goal of encouraging diversity, promoting local materials and manufacturing as well as keeping construction and maintenance costs low. A starting point for the implementation of a low-cost housing concept, is the vast capacity of slum inhabitants
to provide themselves with their dwelling space within the formal frameworks of society. The main element of the concept proposed, is a “lifeline wall” containing all basic amenities necessary for a modern living standard (water and waste water, as well as electricity). Houses are simply plugged into the wall and can be expanded incrementally. The approach of the “lifeline wall” represents an innovative and solution-oriented advance at the questions: How can an architectural approach that integrates infrastructure contribute to the implementation of adaptive and low-cost housing in developing countries? What impact do local materials, appropriate technologies, and participation have and how can one incorporate these into a planning methodology?

KEYWORDS

slum upgrading, low-cost housing, infrastructure, participation, Ethiopia

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Introduction

Nowadays, we live in the most rapid and intense urbanization period in the world’s history. Over half of the world’s population is already urban and it is anticipated that up to two-thirds will live in urban areas by 2050. Ethiopia is one of the least urbanized countries in Africa with a constantly increasing number of people living in cities. This urbanization rate, not in the same track with the economic growth of the country is leading to the increase of the number of urban poor. This urbanization of poverty has as a result the squating of land in cities and their outskirts. The urban slum population is doubled every 15 years what results to poor living conditions and the social and spatial challenges posed by these. Literature differs on the amount of slum dwellers residing in the neighborhoods of Addis Ababa. According to the available literature between 70 and 100 per cent of urban neighborhoods in Addis Ababa are characterized by the lack of basic amenities, such as roads, electricity, water, sewage system and adequate space. The houses in these are often constructed with low quality materials and at a tearing building speed, often overnight -so called moonshine houses. These self-organized dwellings express the tremendous potential of their inhabitants regarding construction skills, knowledge of local materials and building techniques. Nevertheless life quality in these squatter settlements is low. By overlooking building standards, rules and regulations, safety and health of people living in these houses is put in danger. There is need for a planning strategy that can meet in an effective way the challenges posed by such an architecture born of necessity.

Existing solutions

There are different approaches to addressing the problem of informal settlements. In order to cope with informality, poor quality of existing government owned rental housing stock -so called kebele houses- and the housing deficit posed by the urban expansion, the Ethiopian government launches in 2006 the Integrated Housing Development Program (IHDP) according to which, all informal settlements are to be demolished within ten years and Ethiopia is to head for a middle-income status by 2025. The IHDP uses the condominium typology -mostly in the periphery of the city- multistory dwellings in which there is distinguishable ownership of single units and shared ownership of communal areas. The freehold is the radical approach of this program in comparison to kebele houses, but the social connection between the households in condominiums is fragmented compared to open neighborhoods. Since 2013 a deposit is required in order to enter the computer lottery system -through which the housing units are allocated- leading to the exclusion of the low-income population group that cannot even pay the costs for public services, such as water, electricity or garbage

1 according to World Urbanization Prospects: The 2014 Revision.
2 According to UN Report Addis Ababa Urban Profile 2008
3 See Formalization and informalization processes in urban Ethiopia: incorporating informality 2010
removal. The costs are not the only aspect of this modus operandi that make it hard for low-income people to identify with it. The owners cannot expand according to their needs, having to adjust to a strict building typology and it is often hard to make a living from the economic activities in the area due to eviction and random housing allocation. It is clear that there is still need for a comprehensive urban housing development planning tool in the country.

Need for an alternative approach

Such a planning tool should take three important aspects into consideration: infrastructure, local materials and participation by keeping the costs low at the same time. Infrastructure, here mainly referring to sanitation and electricity, is one of the main things that slum dwellers cannot provide themselves with and what significantly deteriorates life conditions when missing. Local materials are easily available at little or no cost and people are mostly familiar with the appropriate building technologies required when working with indigenous resources. Materials such as natural stone, loam bricks and mud construction are ideal for the climatic conditions of the country and thus sustainable and resilient. Participation can enhance the effectiveness of slum upgrading projects, create a sense of individual responsibility over one’s own space and strengthen community ties by engaging people in common activities. Participation of inhabitants during the building procedure is an educational experience that can provide unskilled workers with vocational training. The approach needed should act as an urban framework, by discouraging infinite horizontal development -common practice for slum dwellers originating from lack of technical know-how and use of appropriate materials- and reconstructing public spaces. But how is it even possible to encourage such diversity by keeping financial costs low? The self-promotional attitude that the low-income part of the population has adopted by developing their own dwelling space is an important contribution to low-cost architecture. People already have the ability to implement traditional building techniques and use indigenous resources, they should be enabled to do so within the formal framework of society. A starting point for the implementation of such a housing project needed could be the fundamental element of every prospective house, a wall.

The Lifeline Wall

A “lifeline wall” that contains the necessary infrastructure: water, waste water and electricity is both an architectural element and an urban tool. As an architectural element it is the first wall of a future house, providing both structure and framing space. It supports the weight of prospective floors and roofs and signifies the borders of every property. As an urban tool the “lifeline wall” frames public space, directs pedestrian flow and forms the facade of a street. Dwellings can plug into it over time, temporary shelters, tents and vendor tables are docking into it. Incremental growth can fill the space, while vertical density is encouraged. But wouldn’t just any wall as a form of iconic architecture be enough to initiate urban upgrading? Why is integrated infrastructure such an important part of this approach?

Failure to provide basic services for a contemporary living standard, such as sanitation leads to an increase in health deterioration and social unrest. A main reason for an unsuccessful sewerage system is the magnification in housing density and resulting higher levels of water consumption. The “lifeline wall” ensures that there is controlled density in the urban layout and that sufficient plot areas to accommodate the infiltration system, thus allowing a satisfactory level of the service. Also sewer networks are often damaged by the exposure of the pipes due to soil erosion. Acting as a case for the sewer pipes, the “lifeline wall” guarantees that they would not be affected by climatic factors, such as erosion or flood. The wall also reduces connection costs that would appear in a conventional sewerage system. Costs are minimized by incorporating the sewerage system in the “lifeline wall” as the owners do not have to connect their appliances to a collector sewer down the main highway, a common practice that hides additional costs. So not only there is little imposed loading, but a reduction of as much as 50% in pipe length is possible. Since the responsibility for the maintenance of the “lifeline wall” can be transferred to the residents, reductions in capital and operational costs are considerable. The temperatures in Ethiopia allow plumbing to be installed in the wall without complications. Every house can

4. Compare Sustainable Sewerage: Guidelines for community schemes: the closer the sewer system’s outfall is to the properties served, the cheaper the system will be.
have access to fresh water and vendors and visitors are profiting from the public water tabs.

Upgrading of existing neighborhoods in the inner cities can be like this: initial meeting to provide information of the housing upgrading to the local residents, detailed layout, location of sewer access points, location of the “lifeline wall”, implementation schedules, detailed costs, maintenance responsibilities and group contributions to the construction cost are to be discussed along with a team of local planners. When a part is built, dwellers can start connecting their houses. By building the “lifeline wall” under supervision construction techniques are learned and knowledge of materials is spread. The “lifeline wall” is built as it goes, upgrading the road networks and directing pedestrian flow. Benches, openings, flower pots are extruding out of the “lifeline wall”, it is serving as urban furniture. Micro businesses are docking into it and trade is flourishing. The walkability of the “lifeline wall” suggests a new way of experiencing and understanding public space. Of course, all these ideas of mutual aid, self-help construction, gradual house upgrading, progressive development that the “lifeline wall” encourages, are not new. They are derived from the practices of the slum dwellers.

Conclusion
The complex and diverse challenges presented by informal settlements indicate the need for a support strategy for the slum dwellers. Rather than offering people ready-made solutions to vitally upgrade their settlements, there is time for enhancing their active participation in planning and constructing adequate housing and in a further step, their lives. The “lifeline wall” emerges as a playground, not only for planners and architects, but allows low-income people to take control of their lives and improve their current situation. In the end it is not only the image of the city that can change, but the sense of home is becoming something solid for the slum dwellers. Yes, walls can connect.

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