

SUSTAINABLE URBANIZATION: THE MISSING BOTTOM-UP DIMENSION

Philipp Aerni

Philipp Aerni is co-founder of ATDF and works at the University of Bern and ETH Zurich.

Introduction

Sustainable urbanization in developing countries will be one of the major challenges of the 21st century. Especially in Africa where the current rate of urbanization is fastest and cities are least prepared to offer poor migrants decent living conditions through innovative solutions in housing, urban design, education and infrastructure. Sustainable urban planning in African cities requires a willingness to learn from past mistakes and greater recognition of all the privately organized public services that make living in the overcrowded informal settlements bearable. Supporting the informal activities of these local entrepreneurs and helping them to gradually improve their management practices as well as the range and quality of their services would not just improve the livelihood of the urban poor but also create new economic opportunities. Such public-private partnerships represent the bottom-up dimension of urbanization because they tend to be inclusive and sustainable. But they must also involve innovative academic institutions in the design and implementation of sustainable local solutions in cooperation with local private and public actors. In this context, incentives must be designed for universities to make them more responsive to the needs of the local urban economy. This would require the integration of the science and practice of entrepreneurship into the student curriculum especially in the area of architecture and urban design. Such academic institutions have the potential to facilitate effective collective action in efforts to improve environmental and health conditions in informal settlements and helping local entrepreneurs to get access to public funds and better connect with the formal economy. The following article will illustrate how that might work in the case of the city of Addis Ababa in Ethiopia.

The challenge of urbanization in Africa

Goal 7, Target 11 of the Millennium Development Goals (MDGs) is to achieve significant improvement in lives of at least 100 million slum dwellers by 2020. In response to this challenge UN-Habitat developed in close collaboration with the UN Statistics Division and the Cities Alliances an operational definition of slum dwellers. The definition is largely based on what people lack in these settlements rather than what they have [1]. It includes (1) access to improved water, (2) access to improved sanitation facilities, (3) sufficient-living area, not overcrowded, (4) structural quality/durability of dwellings and (5) security of tenure. One could argue that the problem can be solved by making it a human right to have access to all these necessities. But who

would have the means to ensure the basic provisions and who would manage and sustain them? Human rights with respect to decent livelihood conditions cannot be met unless institutional incentives are put in place that make it more attractive for all stakeholders in the public and the private sector to invest in people, goods and services that contribute to the improvement of the living conditions in poor urban areas. Since such incentives are based on the mobilization of market forces for development, many urban planners are still reluctant to create them. They assume that planning is merely meant to regulate and control markets and not to facilitate new markets that better serve the needs of the poor. The UN Habitat report [2] reflects this attitude quite well in its introduction. Seeing the market as the problem rather than as part of the solution creates however a typical collective action problem because, as even the UN Habitat reports admits, current institutional arrangements are unable to address the fundamental problems in many African cities. Most stakeholders seem content to endorse human rights but do little to make it more than a wish list. The sustainable improvement of poor urban settlements lacks priority and relevance in the public sector agencies and the private sector alike. No wonder then that the proportion of the urban poor continues to grow faster than the rate of urbanization in most African cities [3].

What can be learned from urbanization in Asia and Latin America?

The situation in African cities stands in strong contrast to the one in cities in Asia and Latin America, where the share of slum dwellers has decreased thanks to large-scale investment in urban infrastructure, public-private partnerships in the provision of local public goods and the promotion of technology transfer and higher technical education [4, 5]. Against all doomsayers of public-private partnerships, these actions have led to less and not more inequality because all the knowledge available is mobilized and tapped to find appropriate solutions. As a result, a shift of the city economy from informal to formal has occurred, and once this is happening, long-term urban planning becomes more effective and less harsh for the poor who have now formal property titles. They therefore start to see the opportunities of change more than its risks. It helps explain why 72% of the urban population in Sub-Saharan Africa still live in slums as opposed to 58% in South Asia, 35% in East Asia and 30% in Latin America [2, 3]. The improvements in East Asia and Latin America are reminiscent of a similar development that occurred in Europe during the 19th century, which was actually the century of public-private partnerships (PPPs) [6]. At that time, PPPs helped to

cope with the first wave of economic globalization fuelled by the revolutions in science, agricultural technologies, transportation (railways) and communication (telegraph) [7]. PPPs can be defined as arrangements in which private parties participate in or provide support for the provision of public goods. In most cases the public sector remains the owner of the physical assets and defines the terms of the arrangement in a way that provides sufficient economic incentives for a company to invest in, operate and maintain the good or services it is providing [6]. Unfortunately today people don't remember anymore about the past developments and tend to associate PPPs with privatization and deregulation rather than joint financing public-private partnerships that provide for public goods [8]. While most Europeans do not remember anymore how they developed economically, Asians still do and value PPPs as a vehicle for development correspondingly. That is why Asian investment in African cities may be part of the solution rather than part of the problem considering that the share of informal settlements in Africa has mostly increased over the past decades despite numerous Master Plans. These plans were mostly by designed by urban planners from Europe that always had the best intentions but never wanted to see the challenge of implementation assuming that the public sector can run things just as smoothly as it does in Europe.

The fear of public-private partnerships

The lesson from this divergence happening between Africa and the rest of the developing world shows that the ability of the international community in general and UN Habitat in particular to successfully implement Goal 7, Target 11 of the MDGs is very limited. The UN-Habitat headquarters in Africa are located next to Kibera in Nairobi, one of the largest informal settlements in Africa. Kibera is also the slum that gets most attention from outsiders. Countless projects sponsored by foreign governments and NGOs aim at improving its living conditions for decades but despite all these efforts, Kibera continues to share the same problems and misery of any other African slum. One problem is that the more money that is spent by charities and NGOs on informal settlements, the more likely that governments stop care about them. In fact, many governments seem to benefit from their activities as well as the ongoing existence of informal settlements. They cost them nothing because basic services, schools, hospitals, water and sanitation, waste disposal are mostly privately run by locals - if they are run at all - while the government can collect fees and rents from its people for all kinds of permits [5]. Yet, these short-term benefits are obtained at the expense of long-term disaster because informal settlements operate by definition largely outside the formal legal business environment and therefore offer few possibilities to lift its inhabitants out of poverty through economic growth. Unfortunately, many charities and NGOs operating in slums tend to increase incentives for locals to remain in the informal sector because how would they be able to out-compete professional foreigners in the provision of local public goods and services [9]?

Endogenous economic growth is bottom-up by nature and therefore cannot be achieved by social planning alone but must include local entrepreneurs that serve unmet needs and innovate to out-compete their local competitors [10]. Yet these entrepreneurs face numerous obstacles in their efforts to make profits that would allow them to invest in the im-

provement of their business and hire people. With no formal title, no formal address and no collateral of any acknowledged value there is little chance to attract investors and get access to financial services such as insurance, credit, loans, saving accounts, etc. Moreover, business in the informal economy is burdened with high transaction costs due to the absence of formal legal contracts, bad infrastructure and health hazards due to a polluted environment and inadequate health care that affect economic capacity [5]. Last but not least, UN agencies as well as donor agencies are reluctant to support local entrepreneurs even if they provide useful public services since they believe that this should be the exclusive job of ordinary civil servants according to textbook knowledge - no matter if the public sector fails to deliver [11].

In other words, most people in informal settlements are locked in poverty and there are few resources available to invest in a better life of their offspring, which makes it unlikely that the next generation will be better off. There are however efforts even by large donors and government agencies to unlock enterprise despite these obstacles. Microcredit and micro-insurance schemes proved successful in easing access to financial services. Moreover, vocational training centers for the poor have at least helped poor settlers to acquire some skills they can use in their search for work; and granting collective development rights and issuing land certificates have also stimulated entrepreneurial initiatives to a certain extent [12].

Yet, all this is not sufficient to facilitate growth-oriented entrepreneurship that is based on the creation and successful commercialization of new products and services. This requires much higher amounts of investment and cost-effective regulation in the formal sector [13]. Unfortunately, regulations of private sector activities in Africa, mostly copied from developed countries, are costly and complex. The complexity of the formal business environment is a huge barrier to market entry for resource-scarce informal entrepreneurs. It is not just sufficient for them to be literate, as many development NGOs continue to believe, to attract investment and set up a successful business. They have to master the formal language and practice of business. This comprises the ability to write a business plan that convinces potential investors, to know the basics in management and accounting, to make effective use of new knowledge and technology to improve the offered products and services, to reach out to customers through different marketing channels, to ensure access to the latest business and market data, to build up a network in the private sector and government, etc. Most of these things cannot be learned by merely going to high school or even university. They require careful mentoring and the eventual development of tacit knowledge that enables them to make better use of available codified knowledge and build up a business network [14].

UN Habitat should recognize and support private initiatives in the provision of public goods

The Global Report on Human Settlement 2009 by the United Nations Human Settlements Programme [2] acknowledges that current approaches to urban planning in African cities must change because they continue to use old-fashioned master plans that fail to address the needs of the local people as well as the global challenges such as the depletion of natural resources and climate change. Urban planning systems, especially in Sub-Saharan Africa, are increasingly aggravating urban problems rather than helping to improve human and environmental conditions. Even though the report acknowledges that urbanization is generally a positive phenomenon because concentration creates economic and social opportunities, makes the provision of public goods more cost-effective and helps to restore ecosystems in abandoned rural areas, its recommendations are less convincing. It tends to blame market forces rather than flawed urban development theories for the failure to implement sustainable urban planning. Bottom-up solutions are only recognized as long as they are guided by presumed far-sighted and well-educated social planners that use strategic spatial plans as well as the latest tools of monitoring and evaluation. In fact, one often gets the impression that urban design experts are more excited about the visual power of geographic information systems (GIS) to locate problematic areas than to actually solve the problems. In response to the failing Master Plans they suggest more plans such as site plans, subdivision plans and neighbourhood plans and so on that are likely to further limit the freedom of local entrepreneurial activities and make more difficult to ever manage the transition from informal to formal through economic empowerment. In fact, the authors of the UN Habitat report seem to regard urban informality as a solution rather than a problem, considering it to be an alternative to the market-oriented formal system – as if informal settlements would be devoid of markets. They seem to believe that an informal entrepreneur has made a deliberate choice to have a value-based rather than profit-based business. They see it as a sort of life-style choice or even an anti-capitalist statement.

The fact is however that these entrepreneurs have no choice. They are simply stuck because the informal sector prevents them from having a growth-oriented business that would ensure a better future for the next generation. This undervaluing of the situational context by the authors of the UN Habitat report is related to the so-called ‘fundamental attribution error’ [15, 16] meaning that they have mostly an elite background and tend to ignore different situational contexts. Having grown up in affluence, they never had to live in the harsh environment of slums and were never confronted with existential threats related to natural risks and lack of technological means to address them. Yet they firmly believe that their views are related to their superior education and not to their social status. They think that if only slum dwellers would be as well-educated as they are they would immediately share their preferences and life styles for sustainable development and abandon the desire for material growth. Slum dwellers that make no attempt to get out of poverty and abide to traditional habits are therefore considered to be wise and somewhat educated. Often they are then lucky to get hired as local project leaders for a

foreign NGO due to their alleged like-mindedness. This sort of negative-selection [9] has also been noticed by entrepreneurial slum dwellers who realized that it can be more profitable to adopt the anti-capitalist jargon of the Western do-gooders in order to get a well-paid and well-cared job in a foreign development organization than to actually build up a risky business in a market with no real support infrastructure for entrepreneurs.

The well-meaning but paternalist view of many urban planners ignores that they could actually learn something from local people in the informal sector as well as from local research institutions. After all, they are quite innovative in finding solutions for local constraints because they have experience on the ground; they would very much like to upgrade their businesses or low-cost technologies to serve a larger customer-base – if only they would receive institutional support in their endeavour to run a formal growth-oriented business or university spin-off firm. In a UN Habitat Working Paper called ‘Slums of the World’ [1] the capacity of the poor to find the best solutions to local problems is actually duly acknowledged in the concluding remarks. But they would never call these innovators ‘entrepreneurs’, instead they describe them as being ‘meaningfully involved in the process of improving the slum conditions under which they live’ (p48). Considering this great concern for political correctness in the choice of language, it is not surprising that effective public-private partnerships that are based on well-designed incentive schemes (as described by Grimsey and Lewis [6]) are hardly ever mentioned in the UN Habitat report [2]. The reluctance to look closer at the potential of public-private partnerships may be related to the fact that most contributors have academic degrees in disciplines such as geography, economics and urban planning where they mostly learned theories from the 1970s that are hardly applicable to the global knowledge economy of the 21st century. They welcome interdisciplinary and participatory approaches as long as ‘uncooperative’ troublemakers that do not share the preferred view, strategy or theory are excluded.

The Case of Addis Ababa

Addis Ababa is Ethiopia’s political and economic capital. It is located in the center of the country and covers 54’000 hectares of land with an estimated population of 3.2 million. Despite a relatively low urbanization rate due to various regulations to slow down rural-urban migration and a preference of most foreign NGOs to work in rural rather than urban Ethiopia, Addis Ababa is expected to become one of the fastest growing cities in Africa over the next couple of decades – and it is ill-prepared. The housing-related infrastructure of Addis Ababa has suffered from decades of neglect and misguided urban planning and policy. The large majority of settlements continue to have no access to sanitary infrastructure and services, paved roads, formal waste disposal as well as water treatment. This is especially true for the inner parts of the city which have the greatest concentrations of slums [17].

Most international estimates put the proportion of the city’s population living in run-down slum settlements,

as one of the highest in the world. An alarmingly high percentage of houses in these settlements are roofed with corrugated iron sheets, have mud or earthen floors and are devoid of basic amenities such as toilet or kitchen. The majority of the makeshift houses is single story and attached to row houses. They only consist of two or fewer rooms whereas the average household size is 5.3 individuals. Overcrowding and congestion in these informal residential areas is putting further strain on the neglected infrastructure [18]. Yet, investment in the upgrading of houses or infrastructure by local people and businesses has almost come to a halt because of burdensome and expensive government regulations, unreasonably high down-payments (20% of the construction costs) for house building and extremely high mortgage interest rates. On top of it, private ownership of land is still not possible. City authorities are the sole suppliers of land and the government retains a high degree of control over land use and design. It leases land to private developers and regards this as a major source of revenues. Only plots that do not exceed 73 square meters and form part of a housing cooperative are free of charge. Since most of these plots are however exceeding a minimum of 90 square meters they are also charged. Finally, plots that exceed 175 square meters are available at market prices through public tender. They may involve leaseholds of 50 to 99 years. This rather odd and arbitrary leasing system explains to a great extent why modern privately-financed capital- and energy-intensive skyscrapers, also seen as an expression of 'the Dubai fever' [19] are mushrooming along with poorly maintained informal settlements in the inner city. The result is a dual economy that results in growing social and economic inequality because one part is taking full advantage of economic globalization while the other part is completely excluded [18].

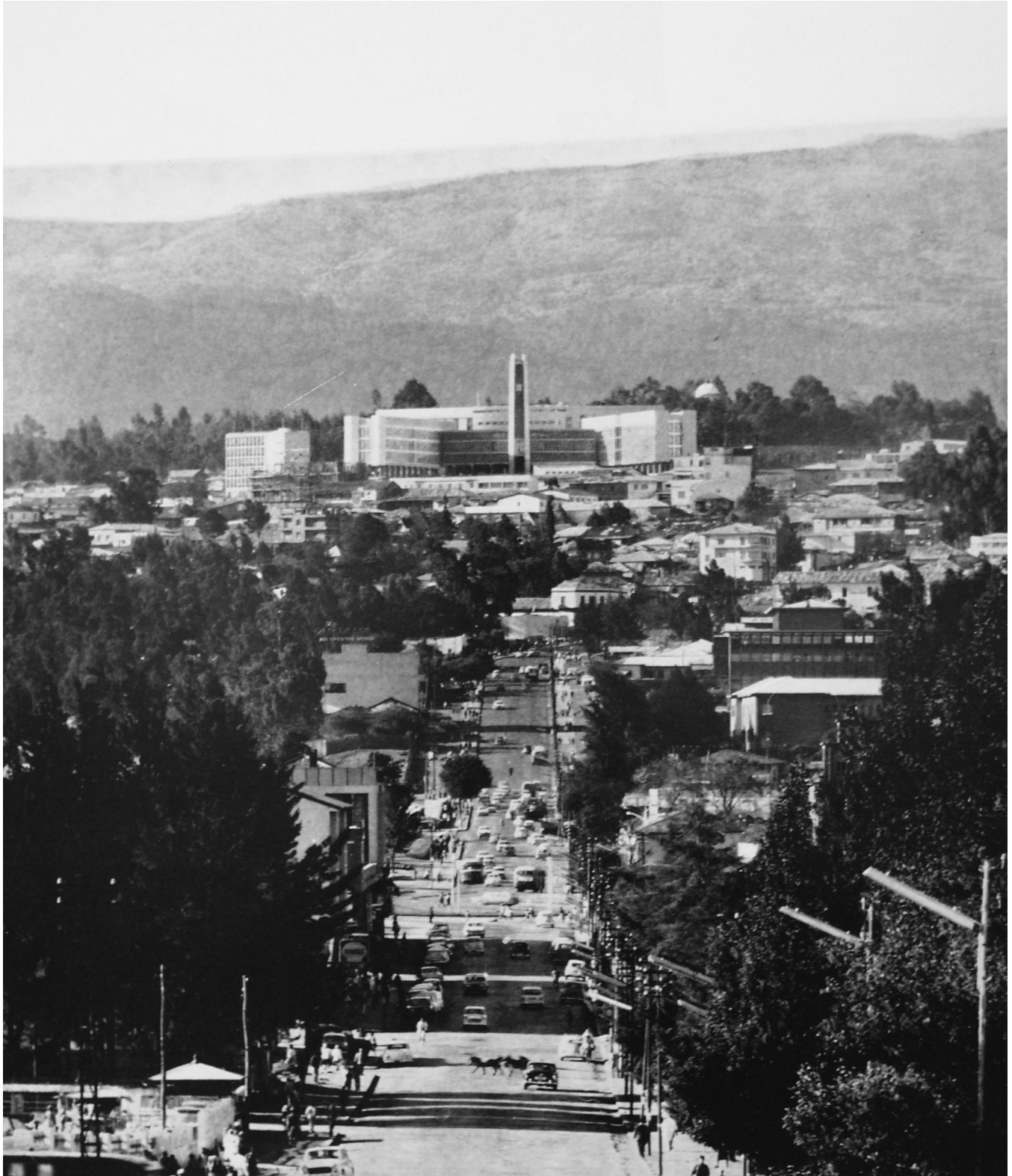
Overall, the Ethiopian People Revolutionary Democratic Force (EPRDF) that came to power in Ethiopia in 1991 and continues to rule the country ever since has achieved little in improving the conditions of the poor in Addis Ababa, despite good intentions. Some would argue that this is not the fault of this government but the result of either neglected or misguided urban planning policies since Italian occupation in World War II. Apart from the great plan for urban development designed by the Italian occupiers, four master plans were designed by European leaders in urban planning between the end of World War II and 1974 when the Communists came to power. The communist regime (Derg) then designed the most flawed urban development policy (again guided by Europeans). They nationalized all urban land and rental dwellings in Ethiopia through a proclamation in 1975. Yet, in the course of its implementation, they did not make any distinction between poor and rich property owners. As a result, thousands of poor owner-occupiers who leased portions of their already cramped dwellings were expropriated of the very rooms for which they were receiving low nominal rent payments. All rental accommodation in poor urban areas was placed under the administration of newly-created institutions, namely, the neighbourhood associations that are known as urban dwellers' associations or kebeles. In addition to the creation of countless new institutions and regulations, the Derg facilitated the preparation of two more master plans for Addis Ababa. Largely guided by ideological reasons, the

revolutionary government strongly encouraged the production of housing through cooperatives. Despite generous preferential treatment throughout junta rule, the net outcome of the junta's housing policy was a near complete disruption of the urban housing market [18].

The lesson of all this is that the city probably suffered from too much rather than too little urban planning. The latest attempt to revive old Master Plan ideas is the Grand Housing Programme (GHP) also popularly known as condominium housing (related to the condominium regulation that was passed in 2004). It was meant to be a response to the huge housing shortage in Addis Ababa and as an alternative to makeshift kebele housing. The aim of the GHP is to build 50'000 housing units a year using Low-Cost Housing (LCH) technology designed by the German Gesellschaft for Technical Cooperation GTZ. The construction of these houses also involves training of locals to carry on the programme themselves later on. However, the construction of these houses consists mostly of imported materials, technologies and know-how and only cheap labor-intensive products and services are provided by local people (most trained in vocational training centres). It is unlikely that locals will be able to continue to run their businesses once the funding for GHP will run out. Their business is unlikely to be able to compete with Chinese firms that may be more capital-intensive but are still cheaper due to specialization and the ability to take advantage of economies of scale. Once again the GHP design is based on a top-down philosophy combined with some Newspeak on the need for participatory approaches. That is why few of the existing condominiums are actually occupied by the poor who are unable to afford and maintain it. Instead those who have obtained one tend to rent it out to generate revenues for themselves [19]. Apart from that it encourages the city once again to leave responsibility for urban renewal and design to foreign actors and neglect their responsibility for the provision public goods.

Overall, the government-driven effort to upgrade housing and urban living standards looks not very convincing. It is already quite odd to assign responsibility for the upgrading of urban infrastructure to the Environmental Development Office (EDO). Its mission and activities are based mostly on catch words such as 'community-led development', 'participatory approach', 'developing a sense of ownership', etc. maybe in the hope of attracting money from foreign donors. The scope of its activities comprises everything from constructing roads, water drainage, toilets, communal water posts and small bridges to creating employment and building schools, public libraries, health stations and market places [17]. One wonders however if the office should rather focus on the few things where it really has competence and otherwise engage in joint financing public-private partnerships not just with specialized firms and private contractors but also local entrepreneurs. In this context, local content requirements could have a great potential to induce foreign contractors to collaborate with local companies and

Addis Ababa: Churchill road in mid 20th Century.



help them improve their goods and services up to a standard required to become a local supplier for the large firm. Instead the government plans everything without really consulting the local private sector. It prefers to leave the implementation to neighborhood and kebele development committees reflecting the city administration's effort to decentralize govern-

ance. In this scheme all the funds allocated by the government have to be matched by contributions from the dwellers. But since the allocation of the matching fund was decided top-down it is not surprising that the dwellers felt a sort of imposition and no sense of real ownership. The lack of upkeep and maintenance of upgraded roads and other infrastructure is a result of this [17].

Addis Ababa: Churchill road in 2008 .



Community-based infrastructure upgrading has nevertheless achieved a lot over the past ten years to improve drainage and other infrastructure necessities in the city but mainly thanks to private initiatives within the slums. One interesting development in this context is the increasing participation of the private sector in collection and disposal of solid waste. It is based on door-to-door collection of solid waste for households that are willing to pay a nominal charge (about one US dollar per month). They pick up the waste and bring it to the nearest municipal garbage dump so that it can be picked up by municipal trucks [18]. This type of business creates employment for the locals and makes a substantial contribution to the provision of a public service. Since 90% (by volume) of the solid waste is organic matter the business could even further be developed by the composting of such waste and sell it as organic fertilizer to the numerous urban dwellers that maintain a garden in the backyard to grow food. Moreover it could address the problem of overflowing landfills not just by introducing composting and better forms of recycling but also the generation of biogas. This would however again require the experience and ingenuity of local entrepreneurs combined with technological know-how from foreign companies. The government could then be the broker to facilitate such collaboration.

The problem of liquid waste is even more serious in the poor areas of the city because they lack a functioning sewerage

system and 25% of the dwellers have no private or shared toilets. The contents of pit latrines or septic tanks are supposed to be collected and dumped by municipal suction trucks but their numbers and services are inadequate leading to overflowing of pit latrines in areas with limited access to roads. Again private operators have jumped in to address the problem but since this business is capital-intensive they charge more than those who dispose solid waste [18]. It would be odd to describe these local operators as people 'meaningfully involved' [1, p48]. They are simply responding to a need and hope to be able to carve out a living from it.

Such private sector activities remain in an embryonic stage unless the government acknowledges the public value of these services and contributes to their upscaling and improvement in the form of public-private partnerships that attract more investment. Moreover, it could enhance affordability of these services by using and extending conditional cash transfer and voucher schemes for poor households that allow them to pick the best service provider for the basic public services - just as it allows to better care for their kids and select an appropriate school. Since contaminated water is the main source of childhood mortality improving water sanitation services and having more budget resources for child nutrition would be mutually reinforcing [21].

ETHiopia Urban Laboratory

In view of all the flawed previous attempts to manage and improve urban livelihood in Ethiopia there is an urgent need to learn from best practices elsewhere and encourage the adoption of more innovative and effective forms of collaboration between universities, the private sector, civil society and governments. Considering the alarming fact that Ethiopia's population is projected to grow from 82 million in 2005 to 170 million in 2050 and that most of this growth will happen in cities (UNFPA Report 2007) planners and policy makers can simply not afford to ignore past mistakes and following business as usual.

There are currently too many duplications in the aid business, too much waste of valuable scarce resources, too much competition where there should be cooperation and too much cooperation where there should be competition [22, 9]. Optimal forms of collaboration as well as possibilities for urban economic growth from the bottom up must be explored. At the same time, new ways must be found to benefit from global economic and technological change by adjusting and combining it with the rich cultural heritage of Ethiopian civilization and its great natural and human resources [19].

In this context, an innovative and fruitful form of interdisciplinary and cross-cultural collaboration has emerged from a joint academic initiative between the Department of Architecture and Urban Design of ETH Zurich and the Ethiopian Institute of Architecture, Building Construction and City Development (EiABC). The main objective of the jointly established summer school for architecture and sustainable development (also called ETHiopia Urban Laboratory) is to bring Swiss and Ethiopian students together in a joint effort to create joint sustainable solutions to problems related to housing, water treatment and business in Addis Ababa. The long-term success of this undertaking largely depends on the appropriate training and support of graduate students who want to add value to their local experience and knowledge by combining it with the newly gained practical knowledge in the joint course on modern business methods and user-friendly new technologies. If it encourages them to design new products and services that better meet the needs of the local low-cost housing market and get investment to convert it into a viable business model then a great step towards a sustainable bottom-up solution in low-cost housing would be accomplished. Their business initiative will be crucial to ensure that the prototypes that are jointly designed in Design Research Laboratories on campus are not just remaining on the shelf. If they manage to eventually reach a level of quality and price that allows for the entry into the booming construction business of Addis Ababa, then new home-grown entrepreneurs will emerge that employ people and attract investment from outside. All this would require an entrepreneurial infrastructure that is still not existing for graduate students in Ethiopia. Venture Funds, Technology Transfer Offices and Technoparks for spin-off firms are rather unknown at public universities in Addis. But the growing

Chinese influence and their efforts to build up special economic zones SEZs to facilitate competitiveness, foster export-oriented production, and promote wider economic reforms, might hopefully also inspire the government's attitude towards a business-friendly environment at universities [23]. Experience shows that universities that engage with the local private sector are not just becoming engines of economic and social change but also improve the quality of research and teaching [24].

How to make a business out of innovative prototypes in housing?

One purpose of the ETHiopia Urban Laboratory was to encourage Swiss and Ethiopian students to think about viable business models related to the so-called Sustainable Urban Dwelling Unit (SUDU). SUDU is a low-cost housing prototype that tries to use local substitutes for expensive imported building materials in Ethiopia. It is to prove that there are competitive and sustainable alternatives that rely on cheap local resources and forgotten traditions in Ethiopia. In order to minimize the use of concrete for example, the SUDU uses a deep foundation that is based on a very thin slab construction in a donut shape. The student group was asked to focus on two innovative components of the SUDU (which was being built on campus at that time) and investigate their potential to be successfully commercialized in Addis. These two components low-cost block production using loam as the basic building material, and tile production and vault construction, a technology that is able to reduce reinforcement material.

Based on the theoretical and practical insights gained during the course of the summer school, the two groups consisting of Ethiopian and Swiss students were asked to explore the market for loam bricks and vault technology respectively in the booming construction market of Addis Ababa. The task was very challenging considering that there were only two weeks to write a business plan that also includes field research and the use of statistical data.

Both groups followed the usual structure of a business plan. They looked at the construction business environment in Ethiopia and the major players involved. In the housing market there are architectural offices that deal with real estate agencies and their private and public sector customers. Once a contract is signed the architectural offices conduct a market bid to determine the general constructor. The general constructor may again subcontract some parts of the construction to specialized companies doing masonry, electrical installations, and floor and roof finishing, for example. In order to successfully commercialize the innovative components the two groups realized that they need to win general constructors as clients for their products. Both groups also learned that business expenses need to be as low as possible at the beginning when big customers still need to be convinced that products can be delivered on time and at a certain price and quality. At this stage it is important to keep almost all costs as variable costs (vehicles, tools and machines are usually fixed costs but by renting this equipment they can be kept as variable costs at the beginning). Once a first big contract has been won and successfully accom-

plished, fix costs can slowly increase together with the variable costs required to upscale production (more labor). Both groups realized how difficult it is to obtain reliable statistical data on the housing market. By means of interviews with the major players involved they could however get a rough idea of how the rules of the game work in the market. Knowing more or less the prices for similar products offered by their competitors they made their cost calculations accordingly. In this context, labor-intensive brick production may sometimes bring a cost-advantage but only if the orders are of a relatively small in scale so that it can be handled within a certain period of time. Once the orders become larger and quick delivery is expected there is increasing pressure to acquire machines that are able to respond to these demands and increase production accordingly. The demand for improved labor skills will increase correspondingly and with it the cost for labor. The group that was concerned with the commercialization of the innovative vault technique realized that this product could also be marketed to rich and individualist customers who search for a new aesthetic housing design that is connected to the latest trend in architecture. They would then offer a premium or first class quality product that is also linked to the award-winning architects that are involved in the SUDU project who would ensure the quality by paying a visit to the customer before the house is inaugurated. The high profits gained in the upscale market could then be used to cross-subsidize the market for cheap vaults in the low-cost housing market. Price differentiation would thus allow an increase in scale as well as scope in the production of innovative vaults.

Despite all the great ideas developed on how to create a successful business out of these innovative components there was also a high amount of frustration in the two groups because it was difficult to really get hold of reliable information and the business network relations of the established players can hardly be challenged unless there is support from government.

Another opportunity to create a market - not just for the innovative components but for the entire SUDU prototype- could be the plan of the Ethiopian government to build new self-sustaining cities in other parts of Ethiopia in collaboration with Urban Designers from ETH Zurich that have great knowledge about the local circumstances as well as the appropriate new technologies. In this context the Ethiopian government could draw on the Chinese experience in efforts to increase the economic importance of small- and medium sized towns on the country side [25]. If this plan is able to win public and private investors it would create a high demand for well-educated architects, planners and construction managers that are able to design models compatible within the Ethiopian context. Low-cost housing typologies will be required for these new towns with new public space and new public facilities, including urban landscape and recycling. If the government would decide to build the new houses based SUDU technology and choose to collaborate with EiABC, then this would substantially increase business as well as learning opportunities for the university and its students. It would also

increase interest of established players in the construction market (including GTZ) to intensify collaboration with the university. The demand for graduate students and professors at EiABC would correspondingly increase and their expertise would be crucial in the resulting public-private partnerships. The quality of teaching and research at EiABC would also increase correspondingly because the a high demand for scientific and, most of all, applied research concerning indigenous construction material, building technology, housing and infrastructure will force the school to regularly update and renew teaching material and make research more focused on solving concrete and practical problems in Ethiopia; based on the experience gained in the implementation of the projects new schemes of good governance and best practice could lead to more cost-effective regulations in planning, construction and building. The ultimate goal is to enhance the local capacity to operate and maintain the stocks of energy, water, materials, capital and space of these new cities.

Concluding Remarks

Economic Globalization is accelerating the process of urbanization especially in the developing world. Judging from the past experience in the developed world, urbanization caused a lot of problems in the short term but turned out to be a natural and positive development on the long run that created new employment opportunities, led to deindustrialization and a new service-oriented economy, produced agglomeration effects that led to more innovations and ideas and helped to alleviate pressure on the natural environment by enabling a transition of labor from agriculture to other more productive economic sectors [3, 4, 10, 23]. A similar development is currently taking place in Asia and will eventually take place in Africa; unless large donors and international development agencies, including the United Nations Human Settlement Programme (UN-Habitat), that focus on the prevention of the negative short-term effects will unintentionally endanger the natural and positive long-term benefits of urbanization. Even though UN-Habitat publishes very valuable country-based situational analyses of urban development (e.g. [18]), its flagship reports (e.g. [2]) reveal a general despise of private sector activities, no matter if these are small entrepreneurs in informal settlements that provide basic services that the public sector fails to deliver, or large international construction companies that are mostly busy building fashionable but energy-intensive skyscrapers. Generally, these reports stick to the old-fashioned assumption from the 1970s that all things related to urban planning, urban design, urban infrastructure and the proper management of urban flows need to be in the exclusive domain of the public sector, no matter if it is able to deliver or not. This assumption would have astonished urban planners in the 19th century that heavily relied on public-private partnerships when addressing the growing challenges of urbanization that were linked to the first wave of globalization due to improvements in public transportation and communication networks. After two World Wars and a long Cold War most of these public-private partnerships (PPPs) were replaced by large government bureaucracies that wanted to have control over the use of technology for

reasons of national security. Once the Cold War was over, public-private partnerships became again an option to address problems in the provision of public goods more effectively. Yet, the vested interests against this institutional change are large and powerful because many established organizations and bureaucracies still benefit from the old system. The organized opposition against PPPs schemes was quite effective by linking them in a negative way to terms such as privatization and deregulation that would benefit large companies at the expense of the poor. Yet, fact is that in most cases governments did not pass on ownership of public infrastructure and other public assets to the private sector. Moreover, regulatory frameworks were not abolished but designed in a way that was more cost-effective and therefore more acceptable to the taxpayer. There are certainly many examples where PPPs did not have the expected positive effects but that is part of the learning process. Many large emerging economies such as Brazil and China have embarked on this learning process and experimented with new models of PPPs. Their experiences largely contradict the doomsday scenarios of the opponents. It has resulted in most cases in improved efficiency and better quality of public goods and services and in the case of Brazil it also helped to reduce social inequality substantially and improve environmental management especially in the crowded cities. A lot can be learned from experiences not just in the large emerging economies but also the smaller developing (e.g. Columbia, Chile) and developed countries (New Zealand, Sweden). UN Habitat should not ignore these incubators of PPPs and their positive development on the process of urbanization.

Ethiopia and its capital Addis Ababa have been a great victim of socialist and modernist experiments in urban planning since the end of World War II mostly guided by Europeans with little understanding of the different needs of the urban population. Considering that many regulatory constraints still prevent entrepreneurship and sustainable innovation in urban design and low-cost housing, a more bottom up-oriented approach to urbanization would be highly desirable. Once things work on a smaller scale the government might then think of scaling it up and give more support to the researchers and entrepreneurs that made it happen.

This approach of starting things on a small-scale and then test the market for the potential of larger investments to upscale production has been chosen by the joint summer school for architecture and sustainable development created by the Ethiopian Institute for Architecture, Building and Construction (EiABC) and the ETH Zurich Department of Architecture. This so-called ETHiopia Urban Laboratory is a first attempt to unite knowledge and experience in architecture, building and urban design to jointly create viable solutions to urban problems, promote local business activities and thus enable sustainable technological and economic change in the city of Addis Ababa. Even though it is too early to assess the impact of this partnership there will definitely be a lot of lessons to be learned from this experience that can then be taken into account by other joint

initiatives elsewhere. Development is a process of trial and error and there is no perfect social planner that can avoid this, as the history of urban development in Addis Ababa illustrates well.

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People in slums do not always work in the informal sector nor is the informal sector exclusively for slum dwellers, but generally, slum dwellers are more likely to be employed in the informal sector than non-slum dwellers.

http://www.sustainability.ethz.ch/lehre/ETHiopia_urban_laboratory/index

The SUDU prototype consists of two stories and a sustainable, autonomous operating water

cleaning facility. The first story of the SUDU is based on ramped earth technology. The second story consists of tiles and blocks. The blocks are used for the 2nd floor construction and the tiles for the vault ceilings.