

# Chapter 9

## Challenges of Sustainable Urban Development: The Case of Umoja 1 Residential Community in Nairobi City, Kenya

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**Abstract** Ineffective planning and implementation problems of urban residential plan in Umoja 1 have undermined the development of sustainable and livable urban community in line with the principles of affordable housing for eco-cities. Consequently, ex post measures designed to guide urban planning and implementation in the community have failed. Multi-story apartments are built in the community although these are not provided for in Umoja 1 residential comprehensive development plan. The project has failed to achieve its objective of building sustainable residential community due to several problems. For one, the planned capacity of roads and streets, water supply and sewerage disposal facilities can no longer cope with the new developments and/or those that result from unauthorized alterations of the original semi-detached units. Poor maintenance has degraded the roads and streets while social spaces are allocated and developed into private property. Chronic water shortage and periodic sewerage spills are common malaise in the community. Overstretched water supply and poor sewerage disposal systems have also exacerbated the problem. All these problems have severely altered the physical, ecological and social character of the community. Lack of consultation and participation of affected interest groups in implementation is one of the factors that have undermined sustainable urban development in the community. This chapter examines Umoja 1 residential plan and the challenges of plan implementation process. It focuses on factors that undermine sustainable development from eco-city perspective.

### 9.1 Introduction

In the late 1970s and throughout the 1980s, the government of Kenya and the Nairobi City Council implemented a strategy of site and service housing schemes.

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The objective of these schemes was to narrow an ever-widening annual shortfall of houses in Kenyan towns (Kenya 2004, UN-HABITAT 2006). This shortfall has however persisted to the present day. According to the National Housing Corporation (2008), an estimated 150,000 housing units are required annually in the urban areas of Kenya to cater for the backlog of unmet demand. However, only about 30,000 units are built every year. Overall, the gap between supply and demand for housing has been widening for all income and social groups in the last four decades.

The Government of Kenya's urban housing assistance programmes focused on two urban social groups. The first social group, the urban poor, lives in informal settlements such as slums and squatter communities.<sup>1</sup> The second group, the low-income households, is the target group for site and service housing. Consideration for housing assistance for this group of households derives from their being in the formal employment.<sup>2</sup> Income from formal employment is reliable and regular. If well managed, the income would enhance the potential of households to access urban shelter. However, this potential is undermined by the inability to raise sufficient levels of finance to underwrite the prohibitive costs of land, infrastructure and services for conventional housing units. Structural urban land markets largely hinder low-income households from owning houses. Better financial terms would support their entry into forms of transitory tenant purchase site and service housing arrangements whereby housing is provided in different phases of completion before the households move in. The households then construct additional rooms at their own cost and convenience; but in line with the tenant purchase agreement and according to the approved plan and design of the units.

The government then initiated a site and service housing programme designed to overcome the housing problems experienced by these social groups. Mokongeni and Dandora site and service schemes in Thika town and in the city of Nairobi, respectively, are good examples of site and service housing that have addressed the shelter needs of this social group. Umoja I residential scheme is another scheme. The houses are tailor-designed and formulated to address the housing needs of first time low-income homeowners who are expected to complete the construction of the houses upon moving in. Formal employment acts as security in tenant purchase agreement and, together with a commitment by the owners to complete construction of their houses according to the approved design and layout plans, are important criteria for the success of Umoja I project. The employment status of those qualified for houses were assessed, vetted; and registered. Completion of the houses, which involved developing the houses would begin as soon as the new tenants moved into the rooms, which were completed during the ex ante phase of implementation, which preceded the longer term ex post phase.<sup>3</sup>

However, the ex post plan implementation activities and development outcomes of the built houses and social environments defy characterization. The house owners have violated provisions and rules of tenant purchase agreement. Public green spaces in the community were also grabbed and gradually developed into private buildings. These actions have undermined sustainable urban development and hindered promotion of eco-city orientations in Umoja I (Ecocity 2009, Ecocity World

Summit 2009). Structural and physical forms of the built environment and the social character of Umoja I are a complete departure from the type of residential community that was originally designed and developed at the end of the ex ante phase.

Moreover, there is potential for environmental risks from frequent shortage of domestic water supply and the breakdown of the sewerage system in Umoja I (Nairobi Chronicle 2008a, b). These problems have precipitated a sanitation nightmare, further complicating the risks associated with water shortage and health risks in urban communities. Other threats to the environment and health include poor surface drainage that results in the inability to manage surface water run-off that clog sewer drains during rainy seasons. This poses a constant threat to environmental pollution and the ever-present risk of diseases from sewage spills and leaks (Nairobi Chronicle 2009). Also, a large number of households have moved into multi-storey apartments as tenants. This has led to overcrowding. The size of private courts and public green spaces for recreation has been reduced, and their quality degraded. The overuse and overloading of transportation infrastructure and social facilities have eroded their quality, reduced their number; and undermined performance standards. All these are sources of threats to sustainability of the urban environment and hinder Umoja I from evolving into an eco-city community.

This chapter is about challenges to sustainable urban development that Umoja I community in the city of Nairobi, Kenya, faces. The community offers relevant lesson for understanding the challenges of planning for sustainable urban development and how these challenges translate into constraints in planning for eco-city communities in Africa. Following the introduction is a discussion of the concept of sustainable development in relation to urban development and the relevance of this to eco-city practices. The next section deals with conceptual and practical issues of site and service housing schemes in relation to them providing a planning and implementation context for Umoja I community. The third section provides a background to Umoja I residential community's goal, as well as a concept plan and development principles of the community. The role of households and Nairobi City Council in plan implementation during the ex post phase then follows. The section on ex post plan implementation phase is divided into two parts: the results of a study that was conducive to the appraisal of ex post plan implementation during the first 10 years of Umoja I from 1978 to 1988, are presented and discussed. Finally, the results of data analysis from a field survey recently conducted by the authors to ascertain the tread of development from 1989 to 2008 are discussed before ending the chapter with a conclusion.

## 9.2 Sustainable Urban Development in Africa

The term “sustainability” has no single definition. Scholars and policymakers define the concept differently. However, it was the World Commission on Environment and Development that gave it a comprehensive and greatly accepted definition (World Commission on Environment and Development 1987) when it defined the term “sustainability” as the need to use and improve the living conditions of the present

generation without compromising the ability of the future generations to meet their needs. The word sustainability therefore straddles the economic, social and environmental aspects of development. Others have argued that sustainability should include institutional systems because both public and private institutions, and the decisions they make, affect and determine sustainable development. The issue of sustainability is important in development in general and urban development in particular. This is because the way we use our resources determines both the quality of our lives today as well as that of future generations.

The challenges for Africa in terms of deepening economic and social progress, and sustaining this progress over the next two to three decades, include addressing environmental and ecological resources issues, and mobilizing resources for development. All these are critical in increasing the capacity of African countries for economic acceleration and sustainable growth. Death from disease is clearly linked to poor nutrition as well as to a polluted environment exacerbated by a lack of safe drinking water, poor sanitation and chemical pollution. The environmental threats facing Africa are a combination of the degradation of local and global ecosystems. In Africa and other developing regions, one of the greatest environmental threats is that of water, whose scarcity is increasingly becoming a critical factor in fostering ethnic strife and political tension. Air pollution and deforestation are also some of the major environmental threats in Africa.

Another set of problems with significant social development implications for Africa stems from the social, economic and environmental consequences of urbanization. The rapid growth in Africa's urban population is a direct result of a shift in the balance between the urban and rural economies, as well as due to the natural growth of urban population. Although Africa is the least urbanized continent in the world, it has the highest urbanization rate of 3% per annum. In 2007, the African urban population was 373.4 million. It is projected that 759.4 million Africans will be living in urban areas by the year 2030, and there will be more than 1.2 billion urban dwellers by the year 2050 (UN-HABITAT 2008). Rapid urbanization in Africa is primarily a result of development strategies that stressed urban growth at the expense of agriculture and rural development. A dismal consequence of this scenario is that the rate of increase in the size of the non-agricultural population now exceeds the rate of increase in meaningful non-agricultural employment, leading to what is known as *over-urbanization* (Hope 1997). Table 9.1 depicts the past,

**Table 9.1** Proportion of African population residing in urban areas by sub-regions, 1980–2030

Region	1980 %	1990 %	2000 %	2010 %	2020 %	2030 %
Africa	27.9	32.0	35.9	39.9	44.6	50.0
Eastern Africa	14.4	17.7	21.1	24.6	29.0	34.8
Northern Africa	44.4	48.5	51.1	53.5	56.8	61.3
Southern Africa	31.5	36.7	42.1	47.1	52.3	57.9
Western Africa	29.2	33.0	38.4	44.1	50.1	56.1

Source: UN-HABITAT (2008)

current and projected urban population by sub-regions in Africa between 1980 and 2030. The table indicates that Northern and Southern Africa are the most urbanized regions of Africa, while East Africa is the least urbanized, but nevertheless the most rapidly urbanizing region of Africa.

The urban areas in Africa remain the focal point of both the governmental and private sector activities and, as such, are the rational settling place for the population. But as the cities and other urban areas grow, further productive activities tend to concentrate within them. These urban areas generate about 55% of Africa's GDP, and yet 43% of its urban population lives below the poverty line (UN-HABITAT 2008). Although the urban areas are the main catalysts of economic growth in Africa, their economic attraction and the resulting urbanization have been major contributors to urban poverty and environmental degradation. Besides, despite the fact that poverty is more pronounced in the rural areas of Africa, urban poverty is increasing substantially.

As the spectacular demographic upheaval that the continent has experienced in the past 20–30 years has shown, urbanization comes with its own problems. As more rural migrants attempt to escape rural poverty, they flood the cities in search of income-earning opportunities. Thus, urbanization is both a contributor to, and a casualty of, the massive migration of people from rural to urban areas, and of the inordinate demands placed on the scarce resources found in the cities. This influx not only intensifies urbanization but also adds another dimension of urban poverty with all of its attendant consequences for further environmental degradation. The urban poor suffer most from this environmental damage.

Often, urbanization is associated with industrialization and development as the growing cities act as pivotal centres of economic growth, generating goods and services as well as employment for the growing urban population. This is what happened in Europe, North America, Latin America, and most recently in a number of Asian countries where urbanization has led to increased per capita income and improved standards of living. Unfortunately in Africa, urbanization is not accompanied by economic growth or better livelihoods. This is a unique phenomenon, which the World Bank has called “urbanization without growth”. This pattern is the result of misguided policies that could not cater for properly managed and planned urban development in Africa. Urbanization in Africa is “a poverty-driven process and not the industrialization induced socio-economic transition it represented in other major world regions” (Kenya 1978, UN-HABITAT 2008: 7).

The state-led and urban-biased development strategies of African countries, combined with various external factors, have weakened the potential of urban regions in Africa to absorb the growing urban populations and provide them with the necessary employment opportunities and services. At the same time, effective formal urban planning is almost non-existent in cities and towns of Africa. Linkages between the process of urban development and planning on the one hand, and rural development on the other, are therefore very weak (UN-HABITAT 2005). As noted earlier, the process of urbanization is not accompanied and supported by industrialization of African economies; and this has translated into a weak urban economic base and high levels of unemployment (UNDP 2005). As a result, in most cities of

Africa, shanty towns and squatter settlements are developing along the periphery of major cities. The poor who live in these areas face tremendous economic and social hardships. They do not have access to basic human requirements such as shelter, land, water, safe cooking fuel and electricity, heating, sanitation, garbage collection, drainage, paved roads, footpaths, street lighting, etc (Suzuki et al. 2009).

Worsening political and ethnic conflicts, the erosion of traditional safety nets, and the deteriorating physical infrastructure and absence of general security in rural areas have further contributed to the problem of rapid urbanization by forcing thousands of people to migrate daily to the relatively safe cities, thereby adding more pressure to the socioeconomic burden of African cities. On the other hand, the Structural Adjustment Programmes (SAPs) implemented in many African countries in the mid-1980s that led to elimination of price controls, reduction of government expenditure on social services, and privatization schemes, resulted in massive layoffs of the “redundant” labour force. This added and exacerbated the economic and social crisis already plaguing the cities of Africa. These and related problems have stoked rapid urbanization in Africa, leading to not only environmental degradation but also putting undue pressure on urban service delivery (water, housing, solid waste management, road, etc.)

Urbanization has also exerted adverse effects on the environment as industries and cars in urban areas release vast amounts of greenhouse gas emissions, which are in turn responsible for worldwide climatic changes. Undoubtedly, climate change is an emerging threat to humanity. This phenomenon has become a major national, regional and international problem, cutting across developed and developing countries. Marked variations in average annual rainfall, daily temperatures, wind direction and speed are some of the common features of climate change that have emerged since the 1950s. This has been followed by increased incidences of natural disasters such as floods, drought and diseases, both in urban and rural areas. Unfortunately, climate change disproportionately affects the poor and those living in the slums. This is mainly because climate change adversely affects the very things that the poor depend on. It also causes extreme warming of the ocean and rise in sea level, thereby adversely affecting coastal cities and islands.

As mentioned above, East Africa is urbanizing at a very high rate. Kenya, for instance, is projected to be 50% urban by 2030 (OXFAM 2009). It is estimated that half of Kenya’s poor will soon be living in urban areas. What is worrisome is that income and social inequality in urban areas continue to increase. Nevertheless, recent moderate economic growth rate and access to educational and health facilities have improved Kenya’s Human Development Index (HDI) from 0.520 in 2004 to 0.532 in 2005, pushing Kenya to the medium human development level. Kenya also succeeded in reducing the prevalence of HIV/AIDS from 13.9% in 1999 to 6.7% in 2003 (UNDP 2006). Although these are commendable achievements the country is still entangled in growing inequality, poor governance, ethnic tension, among other social vices. As correctly indicated by OXFAM (2009: 2):

urban poverty and inequality can have catastrophic social consequences when combined with poor governance and ethnic resentment as the violence in urban informal settlements following the 2007 presidential election made all too clear.

Man-made and naturally induced environmental threats such as unclean and unsafe water, air pollution, and unhygienic habitation cause serious illnesses and reduce life expectancy in Kenyan cities (UNDP 2006). A study conducted by OXFAM (2009) highlights the complex and intertwined and mutually reinforcing challenges of urban development in Kenya. These are:

- Urban residents are almost twice as likely to be infected with HIV as their rural counterparts;
- Children in Nairobi's slums are among the unhealthiest in the country. Over half are likely to suffer acute respiratory infection, and almost half under 5 are stunted; moreover, they are less likely to be immunized than children elsewhere in Kenya, and more prone to diarrhea and fever;
- Population densities can be higher than 1,000 people per hectare in the slums – compared with as low as 4 per hectare in Nairobi's wealthy areas;
- The combination of climate change and unplanned urban growth has led to ever greater numbers of urban houses being severely affected by flooding;
- Social support networks are considered to be weaker in cities than in rural areas and the tendency for ethnicity to be mobilized for destructive ends is on the increase;
- Nearly two-thirds of slum residents interviewed said they did not feel safe inside their settlements; and
- Almost half of Nairobi's population admitted to actively participating in bribery; and almost all thought corruption was endemic in the city (OXFAM 2009: 3–4).

The other major challenge is the rise of crime and violence in Africa's urban areas, including Kenya's. According to the UN-HABITAT (2008: 19), "urban crime and violence is now the first threat to security in African towns". As much as 70% of the urban population in Africa has been victimised by crime (UN-HABITAT 2008). Urban violence and crime are complex socio-economic phenomena that are caused by multi-dimensional problems such as poverty, unemployment, inequity, poor governance, erosion of traditional family values, social and physical segregation, social decay, etc. Strategies to tackle urban violence and crime therefore require an understanding of the social, political and economic issues, which are interconnected, and which often reinforce each other. In this regard, innovative approaches to address this complex and multi-faceted problem are required. Urban violence and crime affect private investment opportunities, reduce public investment in infrastructure, and disrupt effective delivery of services. Most importantly, urban violence and crime affect the majority of the poor, including the elderly, women and the unemployed, who usually live in vulnerable physical conditions and as such cannot afford protection and private security services.

It is suggested that policy response should not halt the urbanization process but rather to develop effective policies for developing basic eco-cities and meeting the housing, infrastructure, and services needs of urban population (White et al. 2008). Specifically, African countries should proactively focus on building the capacity of small- and medium-sized cities so that they can provide effective urban services



to the spiraling numbers of poor urban dwellers (UN-HABITAT 2008). Obviously, urban environmental issues should be of main concern to policymakers and urban planners. The issue of sustainability should be addressed within the context of economic, social and environment framework, and also within institutional systems which will have impact on the quality of settlements and life in African urban areas. According to Suzuki et al. (2009), if proper urban policies are not put in place, the current pace of urbanization will be accompanied by unprecedented consumption and loss of natural resources. Most importantly, from the experiences of several countries which have promoted the principles of eco-cities, developing countries in Africa can achieve urban sustainability in their own way, as highlighted by Suzuki et al. (2009: 23–25) recently as follows:

- Many solutions are affordable – even when budgets are limited;
- Significant success can be achieved using existing, well proven technologies and appropriate new technologies;
- Developing countries should take pride in developing home-made solutions; and
- Many solutions can benefit the poor directly and indirectly.

### 9.3 Site and Service Housing and Urban Development

Norms and practices of planning and implementation in site and service housing programmes are similar throughout Africa, Asia and South America. Srinvas (2009a) outlines three principles that guide implementation of site and service housing units. First, site and services schemes focus on providing the urban poor, who lack finance and power in urban socio-political set up, to access adequate and appropriate housing as a basic need and as a right to a dignified human life. The second principle pertains to the major components of site and service development. This includes land that is available in the form of plots, infrastructure (road and street network and non-motorized movement ways, water supply, electricity and sanitation facilities) and housing structures at various stages of completion.<sup>4</sup> Finance and technical assistance from experts who manage the implementation of different aspects of house and infrastructure construction before target households move in are also part of the second principle. Third, site and services scheme leverage the capacity of the urban poor and low-income households, who would otherwise not own homes, to actively participate in the construction of their own houses at a pace and resource loading they can afford. This absolves the government and other public agencies from solely bearing the burden of urban housing for economically disadvantaged groups in society.

Srinvas (2009b) further points out those housing units are planned, designed; and built at various stages. This gives the low-income households, who own the units under tenant purchase arrangement, the opportunity to easily own affordable houses, with the option of expanding or enhancing the houses repeated at a pace commensurate with their financial capability.



Construction of the house during ex ante phase has to meet five major requirements before owners can move in. First, the structures must meet minimum residential housing space standards. For example, a habitable room must not be less than 3 m<sup>2</sup>. Second, construction costs must be reconciled with affordability by target households in the beneficiary social group. Third, land tenure arrangement and level of infrastructure and services provision have to address long-term needs of secure ownership and improved quality of living. Fourth, there is a degree of involvement by the government, municipal agencies and external development assistance agencies, especially in construction of the housing units, infrastructure and services provision at ex ante phase. Fifth, the tenant purchasers of the site and service housing units are the key implementers as they construct the remaining areas of the house during ex post phase. Local Government Councils are charged with the responsibility of providing oversight implementation management over the building activities of the new owners under the tenant purchase arrangements. Housing structures are built to varying levels of completion in site and service communities. Transportation network (roads, streets) and services (water supply, sanitation and drainage network, education, health and community market facilities) are also fully developed.

Two sets of actors drive the implementation activities during ex ante and ex post phases of site and service schemes. Project financiers, government and urban local government authorities drive the ex ante phase. The first rooms of the house, all infrastructure and service facilities are constructed by or under direct and strict supervision of these drivers. The owners are the major players during ex post phase. They construct the remaining rooms and develop private spaces adjoining their houses. The urban local government of the town also drives the phase through plan and house design approval and providing regulations as well as planning and policy administration. Technical and professional guidance are provided to the owners during the construction of the remaining rooms of their house as well as the development of the adjoining green spaces.<sup>5</sup> Plan implementation activities, especially during ex post phase, determine whether the physical development and social character of the new housing scheme conform to the community envisaged in the plan. In fact, socio-cultural, economic and environmental sustainability of the community in terms of promoting the people's living standards in line with eco-city benchmarks is very much a function of activities during this phase (Orum and Chen 2003).

Site and service housing is one of the most visible urban housing sub-sector in Kenya's major towns. The sub-sector attained prominence as a means of housing delivery for the poor and low-income households in the 1970s and 1980s (UN-HABITAT 2006: 36–46). The Government of Kenya and urban local government councils in partnership with the World Bank and the United States Agency for International Development (USAID) implemented several site and service housing projects in Nairobi and other medium-size towns (Kenya 2004, UN-HABITAT 2009).

Different approaches were used to build in the site and service schemes in Nairobi. In Dandora, Kayole and Mathare North schemes, the Government of Kenya, Nairobi City Council and the World Bank were directly involved during the

ex ante phase of housing construction (UN-HABITAT 2006). Outside government, non-governmental organizations were active in championing the rights of communities during the ex post phase as in the case of Mathare North site and service project. The households are actively involved in the construction of the remaining rooms after they move into their new homes.

### ***9.3.1 Umoja I Residential Community***

Umoja I project is a low-income site and service housing project initiated in 1974 by the Nairobi City Council and the USAID on successful completion of another similar project.<sup>6</sup> Umoja I, a comprehensive housing project, built 3,073 tenant purchase houses at a site located 7 km east of Nairobi Central Business District. The site which covers 126 hectares was planned for a density of 25 units per hectare; translating into 100 persons per hectare and 4 persons per household. The maximum population of this community is projected at 12,000 people. The soil cracks up to 50 cm deep when dry and expands by 50% when wet. Expert advice is therefore required when constructing the foundation for structures, and in landscape design so as to enhance the living environment, which is already preset by annual average temperature of 20°C, and which range between 15 and 25°C. This picture encapsulates sustainability benchmarks of the community and underlies eco-city attributes of residency in Umoja I. However, if this residential housing community has to accommodate a much larger low-income population, as indeed it has over the years, the resulting urban sprawl and additional new infrastructure and services costs are not desirable for two reasons. The first one is the inability of households to meet the costs for additional infrastructure and social service facilities. Secondly, the additional population would lead to higher densities and negatively impact the social and physical environment in the community.

The principles of sustainable urban development are secured in the concept of the plan and design of the houses (McManus and Haughton 2006). The development of the community is organized into a physical form of a “crescent”, which is built on a hexagonal grid and acts as a control in landscape design and a guide to development at both plot and community levels (Mwangi 1997). This has created a system of private and public green spaces, as well as a network for the mobility of people. Plots are 7 m by 18 m, with an effective area of 126 m<sup>2</sup>. Houses are accessible through a hierarchy distributor, collector streets, pedestrian footpaths and a major road that link Umoja I with other urban districts in Nairobi. These define and secure front and rear private green spaces. The internal physical organization of the community is divided into 14 contiguous sectors which are assigned formal reference letters A, C, D, E, F, G, H, J, K, L, M, N, P and Q.<sup>7</sup> Houses in each sector are given numbers 1, 2, 3, . . .  $n$ , where  $n$  is the number of the last house in a sector. There are no two sectors having the same number of houses. Public green spaces, services and infrastructure way leaves, adjoin the plots throughout the community. Sewerage for sanitation and run-off surface drains for storm water disposal and a network of streets are also fully developed (Kenworthy 2006).

Households are expected to manage domestic solid waste at the house level; with Nairobi City Council tasked to collect and transport the waste to a distant public garbage dumpsite. Two nursery schools and one primary school, a health centre, and a community market are also built. A site for the development of additional commercial centre is located close to the community market. Finally, land was allocated to religious and other social buildings in the community. Several churches and mosques were built.

The concept plan of the community and design principles outlined earlier makes three assumptions in order to meet the needs of first-time low-income homeowners with regular incomes. First, this category of urban households aspire to own and live in planned community of houses built around a formal design that meet the requirements of urban amenities and mobility standards. Participation of the owners in the construction of additional rooms using their own finances to complete the units according to the plan underscores this assumption. Second, structural constraints in accessing land and high investment costs of urban infrastructure development and service facilities hinder this category of households from owning homes in towns. It was assumed that some form of financial arrangement that facilitates them to pay for the initial cost of the houses during the *ex ante* phase would enhance the affordability of the houses, which they could pay for by monthly installments from formal employment. Furthermore, owning property through this route is considered a positive step in broadening and strengthening the urban economic base. Third, it is assumed that there exists a critical mass of potential households who aspire to own urban houses. These groups of people can afford and are committed and willing to service long-term tenant purchase credit. However, limited financial assistance to defray initial cost of land, investment in infrastructure and service facilities, as well as part of house superstructure that meet their initial shelter needs is required.

These three assumptions are the basis for *ex ante* and *ex post* phases of implementation of Umoja I residential development plan. The 3-room houses were built at three levels of completion during *ex ante* phase. In the first level, only the kitchen and wet-core and dining room were built. The owner was left with the task of constructing a further two rooms and a perimeter security wall. In the second level, one bedroom, wet-core and a kitchen were built. The owner was to construct one room and a perimeter wall only. In the third level, all the rooms were built and the owner was expected to construct the perimeter wall only. The tasks for *ex post* phase is to complete the remaining respective levels of the 3-room construction, and landscaping the front and rear private courts.

The goal of the plan is to encourage home ownership and discourage rental housing. The five specific objectives are: (i) to assist the Nairobi City Council implement a housing policy and to demonstrate that low cost houses for low-income social groups can be built cheaply; (ii) to influence the Nairobi City Council to adopt a housing strategy that focuses on the specific shelter needs of low-income families; (iii) to provide shelter to eligible low-income families; (iv) to increase housing stock of urban housing units; and (v) to improve the institutional capacity of the Nairobi City Council for implementation of low-income housing

projects – planning, design and ex post implementation management<sup>8</sup> (Regional Housing and Urban Development Office 1983 and Nairobi City Council et al. 2007). Objective (v) in particular seeks to secure sustainable urban development and to foster eco-city practices in Umoja I community (Nairobi City Council et al. 2007, City of Alexandria 2008). However, weak planning and enforcement capacity and poor urban governance in Nairobi City Council has allowed owners to construct extension rooms on front and rear extension, as well as to encroach on reserved public green spaces since the project was first built in 1978.

### ***9.3.2 Ex Post Plan Implementation by House Owners***

A field study was conducted to appraise the 10-year ex post plan implementation of the Umoja I community in 1988 (Mwangi 1988). During this period, owners violated tenant purchase agreement and the plan of the community. The unauthorized construction of rooms at the front and rear, in addition to the permissible 3-room semi-detached house, reveal a grave weakness in Nairobi City Council's institutional capacity. Lack of enforcement of municipal planning and construction rules and regulations has emboldened the owners who have turned to construction of multi-storey rental apartments and commercial buildings from 1988 to 2008. Cases where original 3-room semi-detached houses are demolished and replaced by multi-storey structures covering the entire plot of land are rising by the day. The unfolding urban development chaos has transformed Umoja I from a community premised on social and environmental sustainability and implicit eco-city living; to a tragedy of urban planning in Kenya (Hardin 1968, Brightcloud and Hancock 2001, Mwangi 2009, Eco-city World Summit 2009).

#### **9.3.2.1 Ten Years Ex-Post Plan Implementation Phase, 1978–1988**

The small size of the 3-room house is the most cited reason by the owners for the violation of planning and development provisions in tenant purchase agreement. However, it has since been established that 95% of house owners who have built extension rooms rented the rooms to other tenants to get additional income. Family members used only 5% of houses with extensions for additional shelter. Sixty per cent of house owners without extension rooms in 1978 intended to construct the rooms, of which 60% of this proportion would rent out for additional income. This confirms that construction of unauthorized extensions is not an automatic response to any perceived inadequacy in plot size and the design of the house. The majority of households consider 126 m<sup>2</sup> areas of plot for one house to be adequate, although the violation of the plan and design is a potential source of serious threats to the environment now and in the future. Fifty-four per cent of all respondents in the study were aware of the consequences of unauthorized development on the environment in their community, while 46% said they were unaware. Similarly 68% of the respondents who live in houses without extensions are aware of the consequences of unauthorized development on the environment, while 32% of them expressed

lack of awareness. It is therefore evident that the dangers of unplanned residential structures in the community are not appreciated.

The failure by the Nairobi City Council to enforce urban land use planning and development regulations at least confirms its objective for ex ante phase was not fully realized. The 29.8% level of staffing at the City Planning Department, against a 70.2% gap in pending staff recruitment at the time point to the Council's weak human resource capacity to enforce planning and development regulations. It also partly explains the unusually weak ex post plan implementation management regime. Following these weaknesses, the trend of construction of unauthorized accelerated during the latter years of 1978–1988; i.e. between 1982 and 1986. Distribution of the constructed unauthorized rooms during the second half of the 5 years is 2, 3, 5, 12 and 13 respectively, in the 50 housing units with rooms, were in the sample that was collected for appraisal. Indeed, of housing units with extensions, 70% had extensions built between 1982 and 1986, out of a total of 668 or 21.7% of houses with extension rooms in 1988.

The main cause for the unauthorized development is poor urban governance at the Nairobi City Council, which is reinforced by understaffing in the City Planning Department. There are six major outcomes from unauthorized development at the plot level. First, additional connections of the water supply system means that the 216-litre water storage tank installed in each of the 668 extensions held an additional 144,288 l of water at any one time. This was obviously not planned for. Second, additional sewer connections not only reinforced the problem associated with new water demand on existing water supply but also introduced stress on the designed capacity of the sewerage network. Third, at a rate of 1.3 kg per person per day in solid waste generation, households that lived in extensions produced additional 24,315.2 kg of solid waste during a 4-week period. Fourth, the construction of extension rooms on private open space at the front and rear of the main house led to an increase in the number of physical structures on each plot and a reduction of recreation and amenities space. Mobility on the plot was also severely curtailed. Finally, the trend in overcrowding the houses eroded the quality of social environment in the community. Besides, it altered micro-climate of community physical environment. These six outcomes initiated the degradation of the living environment of the 3-room house and the 668 extension rooms built by 1988. It was projected at the time that the remaining 78.1% of the 3-room houses without extensions would have had at least an extension room built, or the existing structure altered by the end of 2010 if the trend continued uninterrupted.

### **9.3.2.2 Twenty Years of Ex Post Plan Implementation by House Owners, 1988–2008**

A field survey was carried out in early 2009 to confirm whether the construction of unauthorized extension rooms had stopped or continued during the last 20 years – 1988 to 2008. The survey that covered 30 housing units, about 1% of the 3,073 units, revealed that the trend has continued. In 2008, tenants consisted of 63.3% of sample residents and 36.7% were landlords, which reveal that tenancy housing is the

dominant form of residency. Twenty per cent of the units covered in the survey have front and back extensions demolished and rental multi-storey buildings constructed in their place. The tallest multi-storey building has 5 floors built, and the highest number of rental rooms per floor is 8. Occupancy has also increased with 36.7% of household sizes in the units with 5 members each, while 26.7% of households have 4 members each. The original house is designed for a household size of 4 members. The size of 5 in the 36.7% of households is obviously higher than the recommended figure.

The survey covered 63.3% of tenant and 36.7% of landlord households. The lowest and the highest monthly rental by the tenants are Ksh 4,000 and Ksh 15,000, respectively, with 30% of the tenant paying Ksh 9,000.<sup>9</sup> Forty-three per cent of households have lived in the community for less than 10 years, while 56.7% of them have lived in the community for more than 10 years. The main reason for choosing Umoja I for rental housing is affordability (40%) and proximity to work place (10%). Construction of unauthorized extensions during 1988–2008 ex post phase of plan implementation has therefore continued. Of the newly constructed extension rooms, 96.7% and 93.3%<sup>10</sup> are connected to existing water supply and sewer line network respectively. This implies that direct provision of water to each tenement in the newly-built multi-storey apartments is considered to be more important than sanitation. Some tenant households living in these apartments do not have private sanitation rooms, – and several of them have to share the few rooms that are annexed to the apartments. This confirms that interference with service facilities, especially water supply, sanitation facilities, as well as open green spaces, has continued unchecked. As discussed earlier, this confirms the connection between continued construction of additional extension rooms with the problems of water supply and seepage of raw sewer into the portable waste systems that are frequently reported in the local media.

## 9.4 Conclusion

This chapter has discussed the ex post plan implementation of Umoja I low-income residential housing development. Implementation activities by house owners present daunting challenges to the sustainability of urban development, and has impacted negatively on the community. The house owners continue to construct unauthorized buildings that are used for rental and commercial activities. The inability of the Nairobi City Council to enforce land use and construction rules has led to these ex post implementation factors from 1978 to 2008, with deleterious implications on the built environment. Six factors have been noted here to have severely undermined the sustainability of Umoja I as an urban residential community poised to promote eco-city lifestyles (Alexandria City Council 2008).

The first is the altered and changed structural forms, character and functions of buildings. Second, planned capacities of roads, streets, water supply and sanitation networks and social facilities are overstretched, undermined and can no longer cope

with increased loading without expanding the existing capacity. The third is the degradation of the social and physical environment, which is a gigantic daily challenge. These are hindering the realization of the benefits that come with planned urban development. Fourth, almost all houses are built beyond original planning and design level of completion. Densification of built structures with high-rise rental and commercial buildings dominating sites previously designated for a mere 3-room low-income house has spilled into public green spaces. A major physical and ecological change has therefore taken place in the community. Fifth, households from outside Umoja I have moved to live and work in new multi-storey apartments and commercial buildings; and this trend is on the rise. The community population has increased several times beyond the initial 12,000 people. Finally, service facilities such as those of water and sanitation stand out as areas of grave concern because they are overloaded and have turned out to be as a source of constant water supply shortage besides the health risks presented by the constant leaks from sewer pipes.

Overall, densification of unplanned for built structures and the additional population that has moved into Umoja I pose the greatest challenge for sustainable urban development in the community. The rental extension rooms built between 1978 and 1988; and the multi-storey buildings that were constructed in last 20 years, have severely weakened the principles of sustainability that were in-built in the concept plan and design of the houses along eco-city perspectives. The outcomes from this change include new factors in local microclimate, threats to social order, as well as increased potential risks from environmental neglect and poor services delivery. Lack of civic measures to stem, arrest and manage these outcomes undermine the promotion of eco-city standards of living in Umoja I community.

Traditional site and service schemes and low-density site and service housing may contribute to sustainable urban development on two interrelated grounds. The first involves elevating the importance of urban development to the level of regional and national economic and social development and environmental management. Clearly articulated goals in regard to employment creation and income generation in cities and towns should inform this concern. The second concern has to do with effective urban planning and implementation management of urban development projects during *ex ante* and *ex post* phases. Specifically, to overcome current challenges, effective and accountable urban governance, which is lacking in the Umoja I community, should focus on planning and implementation management process for sustainability and promotion of eco-city attributes if life in the community is to be reclaimed and retained.

## Notes

1. This group is entirely excluded from access to urban shelter by a host of problems ranging from lack of employment, unreliable sources of income and collateral that would guarantee them access to housing finance from banks and non-banking financial institutions. This problem, combined with the inability to access urban land, hinders households in this group from owning formal urban housing.



2. Proof that at least one head of household has a formal job and earns a regular monthly income that qualifies her/him to join the scheme.
3. Ex ante implementation is when all works are done on site and service schemes and housing structures built at agreed levels of completion. It also involves the laying out of the requisite infrastructure and provision of essential services *before* target households move into their new houses. Ex post implementation is the building of additional rooms by households themselves according to the pre-approved house designs and site development plans in line with the provisions of the tenant purchase agreement between the owners and the development agency *after* target households have moved into their new housing structures. In this case study, the agency is the Nairobi City Council.
4. Apart from housing structures that are built to varying levels of completion, site and service housing communities benefit from an approved community development plan that caters for a transportation network, service facilities and drainage network and social services.
5. This development control involves policing and enforcing building and site development regulations so that they meet the expected land use development and habitat standards.
6. The project, Kimathi Housing Estate, comprises of 343 medium income housing units that were built in 1970, 4 km to the east of Nairobi Central Business District. A bank loan of US\$10 million was secured in 1973 to finance Umoja I project.
7. There were no designed letters B, I and O.
8. The Housing Guaranty Programme (HGP) of USA guaranteed the bank loan of US\$10 million that was secured by Regional Housing and Urban Development Office for the project. Nairobi City Council was given the loan and the Kenya Government guaranteed the loan.
9. Official exchange rates at the time was US\$ = Ksh 76.
10. These figures are for the households surveyed.

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