



DIRECTIONS IN DEVELOPMENT  
Environment and Sustainable Development

# The Future of Water in African Cities

*Why Waste Water?*

Integrating Urban Planning and  
Water Management in Sub-Saharan Africa:  
*Background Report*

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# Contents

|                                                                                              |           |
|----------------------------------------------------------------------------------------------|-----------|
| Introduction .....                                                                           | 3         |
| <b>1      Urbanization in Sub-Saharan Africa .....</b>                                       | <b>5</b>  |
| 1.1      Current status and future trajectory.....                                           | 5         |
| <b>2      Urban Expansion, Structure and Form, and Risk.....</b>                             | <b>8</b>  |
| 2.1      Urban expansion .....                                                               | 8         |
| 2.2      Urban structure and form .....                                                      | 10        |
| 2.3      Urban risks .....                                                                   | 12        |
| <b>3      Urban Planning Theory and History of Planning in Sub-Saharan Africa .....</b>      | <b>19</b> |
| 3.1      Urban planning theory .....                                                         | 19        |
| 3.2      Rational comprehensive planning.....                                                | 19        |
| 3.3      History of planning in Sub-Saharan Africa.....                                      | 20        |
| <b>4      Contemporary Planning Practice .....</b>                                           | <b>23</b> |
| 4.1      Contemporary planning practice in Sub-Saharan Africa: An overview .....             | 23        |
| 4.2      Strategic urban planning and national planning legislation .....                    | 25        |
| 4.3      Detailed land use planning.....                                                     | 27        |
| 4.4      Planning for resilience: reducing risk .....                                        | 29        |
| 4.5      Incorporating infrastructure, resilience planning and health considerations .....   | 32        |
| <b>5      Institutions, Accountability and Water Management .....</b>                        | <b>33</b> |
| 5.1      Understanding urban water management: resources and supply .....                    | 33        |
| 5.2      Local level planning, institutions and financing in intergovernmental context ..... | 37        |
| <b>6      Conclusion: Integrating urban planning with urban water management.....</b>        | <b>45</b> |
| Annex 1      References .....                                                                | 54        |

# Introduction

This paper is one of a series of analytical studies commissioned by the World Bank's Africa Region and Water Anchor which are intended to identify and address the future challenges of urban water supply, sanitation and flood management in Sub-Saharan Africa's (SSA) cities and towns. Following the Terms of Reference for the assignment, and as indicated by its title, the paper is directed at understanding and describing the linkages and interdependencies between water management and water security on the one hand, and urbanization, urban planning and development on the other.

This is a big topic. Our focus is on how urban planning in SSA (or its lack) impacts on water management and security, with less emphasis on the impacts of water (and its management) on urban planning. By discussing the experience with regard to these connections, the principal aim is to analyze and illustrate how urban planning, and, more specifically, its core element and practice, land use planning, along with another key element planning for urban resilience, is currently or can in the future contribute positively to water management and security – this within the broader context of the emerging approach of integrated urban water management (IUWM). As defined by another paper in the series

IUWM is a new approach for UWM that provides guidance to planning and management of urban water systems that takes environmental, economic and social interactions into account. IUWM incorporates all parts of the water cycle and recognizes them as integrated systems while considering water demands for residential, industrial, agricultural and ecological consumptions. Furthermore IUWM is an iterative process that integrates institutional bodies, different water sector infrastructure systems, and water quality and quantity aspects during the decision making process (Patel School of Global Sustainability, 2011: 19).

The paper is structured in six sections. Section 1 presents an overview of urbanization trends in SSA. This is followed by a discussion in Section 2 of what can be seen as the corollary of the unprecedented urban population growth now occurring and projected for SSA – large-scale urban expansion, involving potentially massive increases in urban land cover. This expansion has implications, also discussed in Section 2, for the internal structuring of African cities and towns, and for the planning and development of the overall urban form which is resulting, as well as for the environmental risks cities and towns face now and into the future.

Urban planners in SSA now need to deal with the consequences of rapid urbanization and the expansion of their cities and towns in providing shelter, infrastructure and services for residents, whilst facilitating urban economic development and reducing the conjoined continuing high levels of urban poverty and urban informality. It is generally acknowledged that there are immense challenges with promoting this agenda. As one recent account has it:

While the benefits of urbanization are clear and supported by precedent, the pace of change occurring in Africa is placing immense strain on existing urban infrastructure systems, exacerbating an already prevalent shortfall in infrastructure investment requirements across the continent. Until infrastructure systems are enhanced they will continue to place strain on urban productivity. Poor urban planning is also mounting pressure on commercial hubs, adding to congestion, and hindering the provision of basic services to urban inhabitants (Standard Bank, 2011: 7).

This “poor urban planning” in the present-day has its roots in the inherited practices of colonial-era planning theories and practices, which are described in Section 3. These still resonate, as discussed in Section 4, which discusses key constituent aspects of contemporary planning systems in Africa, as illustrated by a number of case studies. In Section 5, the focus shifts to the current institutional experience with urban water management, again with a number of good practice cases provided.

We then turn in the concluding Section 7 to the key concern of this issues paper: that of integrating urban planning and water management as the IUWM approach emerges – or, perhaps to put it better, of finding ways in which such integration can promote the emergence of IUWM. This is a necessary but difficult task, complicated by the reality that, as seen in the quote above, IUWM requires quite considerable coordination within the water sector alone. Moreover, our preceding analysis demonstrates – and this is the core argument of this paper – that seen from the side of the overall urban

planning system, the deficiencies, decline and the delegitimizing of the ‘traditional’ planning system and practices in SSA, and the theory which underpins them, along with the failure to modernize them in a consistent fashion, has led, if anything, to greater fragmentation in the planning and managing of urban development. Land use planning and infrastructure (and other sector) planning, including water, typically occur in an uncoordinated fashion. This makes planning adequately for large-scale urban growth and expansion that much more difficult.

Given this situation, it is widely acknowledged by planners in SSA that the urban planning system – and the process of plan making which lies at its heart – needs to be reconfigured. Accordingly, we introduce a broad typology/classification of planning regimes in African cities and towns which is tentatively linked to city scale. Then, drawing on the work of Carter et al (2005) and the International Water Association Cities of the Future Program (2010), we propose a number of principles that can underpin the integration of land use planning and planning for resilience with water management, along with a preliminary benchmarking in the form of a simple checklist, by which municipal authorities and associated stakeholders can assess their progress towards a more joined-up, integrated development planning system. A number of examples of good practice towards this goal are provided.

# 1 Urbanization in Sub-Saharan Africa

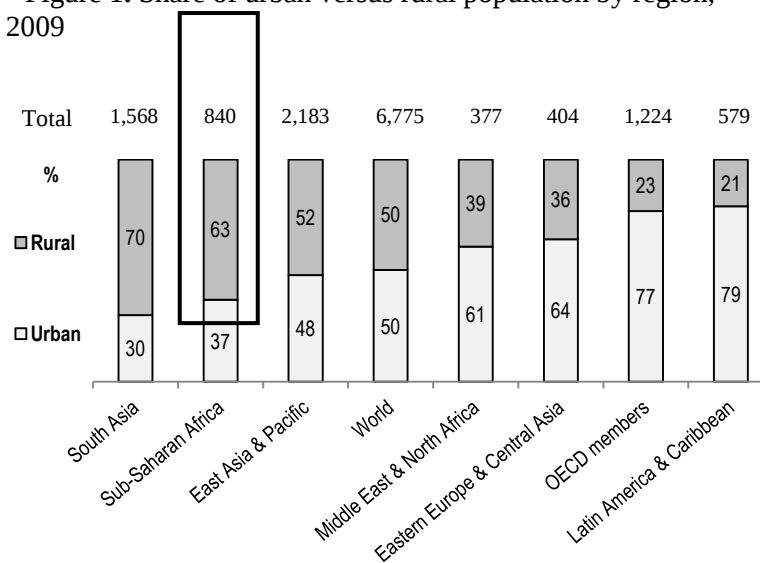
## 1.1 Current status and future trajectory

In the past decade, African economies have been integrated to a greater degree than before into the global economy, principally via the medium of hard and soft commodity value chains. This has propelled economic growth, which has been further underpinned and strengthened by growing consumer demand. Growth and investment have driven the expansion of a varied and principally urban middle class. At the same time, most African societies are undergoing rapid urbanization, accompanied by urban spatial expansion as cities and towns enlarge and grow outwards to make room for urban population increase. The built environment, which is often viewed by analysts as a mix of combination of post-colonial or independence central business districts and large-scale informal settlements, much of these in peri-urban locations, along with a limited number of so-called gated communities falling in-between, is undergoing considerable changes (Bloch, 2011).

SSA is the second least urbanized region in the world, after South Asia. Urban growth rates – currently in the order of 3.4 percent – however now make Africa the fastest urbanizing continent (UN-HABITAT 2010).

Figure 1 below places SSA within the global context, and shows that the overall urbanization level is below the global average of 50 percent as of 2009.

Figure 1. Share of urban versus rural population by region, 2009



Source: World Bank, 2011

Africa's total population is currently a little over one billion, after averaging a growth rate of 2.4% over the last two decades. It is projected that the population will rise to 1.4 billion by 2025, and to 2.1 billion by 2050. Rapid urbanization is occurring parallel to this population growth. Just over 40 percent of all Africans are urbanised, as seen in the figure above, as compared to 28 percent in 1980. Africa today hosts an urban population roughly equivalent to that of North America and Europe together (Mabin et al 2011).

By 2030, it is estimated that the total African population will be just over 50 percent urban, which marks the point, reached in 2009 for the world, at which Africa's urban residents will outnumber their rural counterparts. Kessides portrays Africa as being on the brink of a demographic inflection point, as "the numbers of new urban residents are projected to rise sharply by over 300 million between 2000-2030 – more than twice the rural population increment" (2006:27). By 2050, the urbanized proportion will be above 60 percent: at 1.23 billion people, this represents a tripling of the current urban population (UN-HABITAT,

2010). By that time, some one in five urban residents worldwide will live in Africa (Standard Bank, 2011).

Urbanization levels vary across both Africa's regions and its 54 countries. Southern Africa and Northern Africa are currently far more urbanised than Eastern, Central and Western Africa. At the regional level, Table 1.1 below summarizes the trend in urban population growth as the overall proportion of people living in urban areas.

Table 1.1 Urban Population Trend (%)

| Region   | 2010 | 2020 | 2030 | 2050 |
|----------|------|------|------|------|
| Eastern  | 23.6 | 27.6 | 33.3 | 47.4 |
| Middle   | 43.1 | 49.6 | 55.9 | 68.1 |
| Southern | 58.7 | 63.5 | 68.3 | 77   |
| Western  | 44.9 | 51   | 57   | 68.4 |
| SSA      | 37.2 | 42.2 | 47.9 | 60   |
| World    | 50.5 | 54.4 | 59   | 68.7 |

Table 1.2 highlights that the urbanization rates (i.e. the rate at which urban population grows)<sup>1</sup> of individual countries across the region also differ.

Table 1.2 Urbanization Rates

| Urbanization rate | Definition                                                 | Countries                                                                                                                                                |
|-------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Low               | Between 0 – 3 percent                                      | Botswana, CAR, Congo, Rep., Gabon, Mauritania, South Africa, Swaziland, Zambia, and Zimbabwe                                                             |
| Medium            | Greater than or equal to 3 percent and less than 4 percent | Cameroon, Cote d'Ivoire, Ghana, Guinea, Kenya, Lesotho, Madagascar, Namibia, Nigeria, Senegal, Sierra Leone, and Somalia                                 |
| High              | Greater than or equal to 4 percent                         | Angola, Benin, Burkina Faso, Chad, Congo, Dem. Rep Congo., Ethiopia, Liberia, Malawi, Mali, Mozambique, Niger, Rwanda, Sudan, Tanzania, Togo, and Uganda |

*World Bank, 2011 as cited in Torres 2011*

Within this framework, Sub-Saharan African countries fall into one of three band clusters according to the rate of urban population growth<sup>2</sup>: low urbanizing countries (0-3 percent); medium urbanizing countries (3-4 percent); and, high urbanizing countries (greater than 4 percent) (Torres 2011).

Urban population growth in Africa is the result of three factors: natural population increase; rural-to-urban migration, which in many countries appears to have reduced in relative importance; and the revision of municipal boundaries as urban spatial expansion occurs, and the urban limit moves out into the peri-urban and rural peripheries, incorporating areas and

<sup>1</sup> By contrast, the level of urbanization is the percentage of the total population living in towns and cities.

<sup>2</sup> This represents the average between 2000 and 2009.

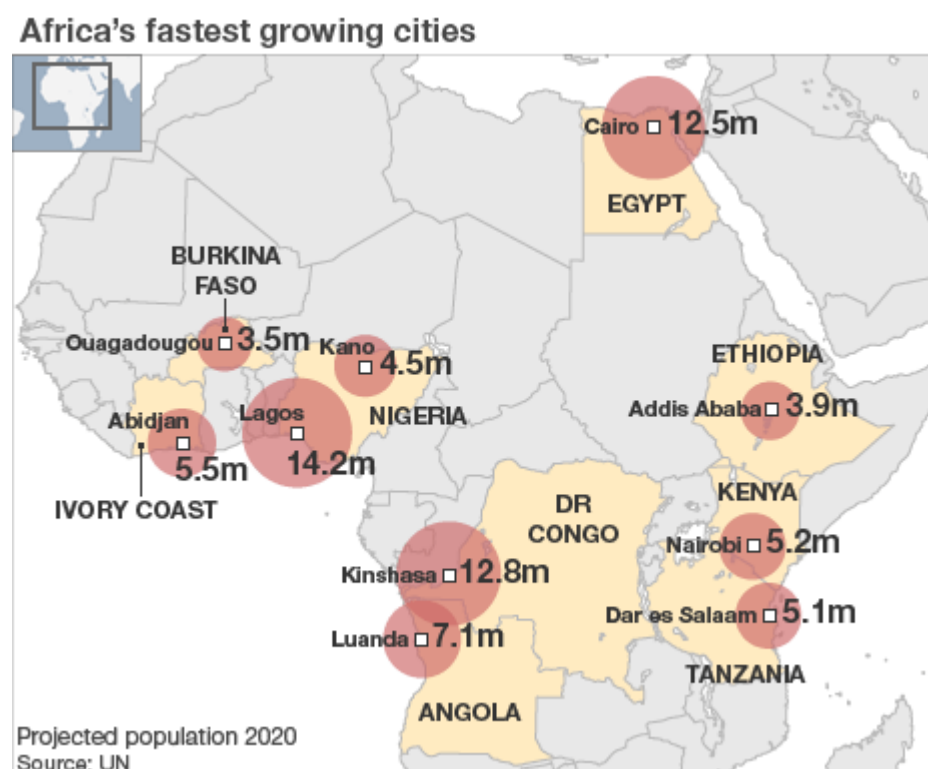
settlements which were previously not categorised as urban. The boundary between urban and rural is porous, however, and there is a high degree of interconnection and interdependence between both, which can be seen as a settlement continuum characterised by rural-urban linkages around livelihoods and market access.

Urban population growth is occurring at all levels of such national settlement systems: in the small number of megacities of 10 million plus people, in large cities/metropolitan areas (one million to 10 million), and in smaller intermediate and secondary cities of under a million people. The latter absorbed roughly three-quarters of urban demographic growth between 2005 and 2010. This “persistent demographic momentum” in smaller cities, as UN-HABITAT (2010) terms it, is expected to continue, with the next decade showing the same proportional trend. Exemplifying this are areas such as Nakuru, Kenya and Dire Dawa, Ethiopia which between 1990 and 2006 grew at 16.6% and 7.8% respectively (Standard Bank 2011).

Large cities – there are approximately 50 cities in Africa today with populations of over one million – also grew rapidly in the same 2005-2010 period, adding 17 million inhabitants, and had a combined population of 126 million in 2010, or about 32 percent of total urban population. According to UN-HABITAT (2010), in the decade between 2010 and 2020 a further 40 million people will be added to these large cities: with the exception of South Africa’s large cities and Brazzaville in the Republic of Congo, all million-plus African cities will thus increase their populations by around a third in the period.

Meanwhile, while the vision of a continent-wide explosion of megacities has yet to occur. Lagos with 13.1 million people will overtake Cairo as Africa’s largest city by 2015. Kinshasa will follow closely. In Southern Africa, Luanda, which is currently already Africa’s fourth largest city, will grow at a rate of close to 50 percent between 2010 and 2020.

Figure 2 illustrates projected growth to 2020 for some larger cities.



Source: BBC News.

## 2 Urban Expansion, Structure and Form, and Risk

### 2.1 Urban expansion

Urban expansion refers to the process of growth and spatial enlargement of an urban area(s). Most commonly, it occurs when an area reaches capacity and further services and facilities are required for inhabitants. In countries with strong and efficient planning systems such as the United Kingdom, the United States or Australia, planners make provision for particular urban areas to expand beyond their current boundaries to accommodate or alleviate growth pressures and provide the necessary services and service infrastructure.

In SSA such rapid physical expansion is occurring as the urbanizing front line moves outwards on city and town peripheries and, simultaneously, as older areas and neighbourhoods make room for in new residents and economic activities sketched above. Peripheral spreading is the principal aspect of spatial expansion. While recent overview accounts of urban Africa (e.g., Meyers, 2011) highlight the conditions of heterogeneity and diversity which result for African cities, there are nonetheless certain commonalities which can be sketched here.

The most comprehensive global overview of the spatial expansion process is in a policy report recently published by the Lincoln Institute of Land Policy, entitled *Making Room for a Planet of Cities* (Angel et al, 2011). The report combines measurements of urban land cover, estimated population growth rates and a set of assumptions about continuing decreases in urban density. This allows the calculation and projection of the amount of land cover involved in urban expansion between 2000 and 2050.

In a general sense, Angel et al predict that densities will continue to decline as they have been doing for the last century or so, and particularly in fast-growing cities where incomes are rising and transportation remains accessible and affordable. There is a strong correlation between increases in income and expansion (or de-densification). This is estimated as a 40 percent decline in density for a doubling of income per capita, to a large extent as a result of more affluent citizens seeking out more land-extensive residential circumstances.

The study specifies the projected scale and intensity of country- and region-specific urban expansion until 2050, given three possible density scenarios as the world population doubles:

- Densities remain unchanged, resulting in a doubling of urban land cover;
- Densities decrease by 1 percent annually, with urban land cover consequently trebling;
- Densities decrease by 2 percent annually, with a five-fold increase in land cover.

For Africa, Angel et al's formulation combines 371 large cities, which are defined as having a population of 100,000 or more, with the continent's smaller settlements. In 2000, total land cover in Africa was 18,120 km<sup>2</sup>, or 0.12% of total land area. The world total was 339,836 km<sup>2</sup> or 0.47 percent of total land area, with the figures in developed and developing countries respectively 0.62 percent and 0.37 percent. A second indication of urban expansion is urban land cover as a portion of total arable land area. In 2000, around 4 percent of worldwide arable land area was covered by urban areas. For Sub-Saharan Africa, the proportion was lower than that for the globe, at 1.5 percent.

SSA then leads world regions in terms of change. If the highest projection above is used, urban land cover is estimated to increase by no less than twelve-fold between 2000 and 2050 (see Table 2.1). This establishes significant challenges for urban planning authorities.

Table 2.1 Urban Land Cover Projection for Sub-Saharan Africa 2000-2050

| Region | Total Urban Pop in 2000 (mil) | Total Urban Land Cover in 2000 (km <sup>2</sup> ) | Urban Land Cover in Large Cities (km <sup>2</sup> ) | Urban Land Cover in Small Cities (km <sup>2</sup> ) | Urban Land Cover Projections (km <sup>2</sup> ) |        |        |         |         |         |
|--------|-------------------------------|---------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------|-------------------------------------------------|--------|--------|---------|---------|---------|
|        |                               |                                                   |                                                     |                                                     | Annual Density Decline                          | 2010   | 2020   | 2030    | 2040    | 2050    |
| SSA    | 208                           | 26,500                                            | 12,778                                              | 13,721                                              | 0                                               | 37,568 | 52,304 | 71,375  | 94,325  | 120,182 |
|        |                               |                                                   |                                                     |                                                     | 1                                               | 41,519 | 63,884 | 96,347  | 140,716 | 198,147 |
|        |                               |                                                   |                                                     |                                                     | 2                                               | 45,886 | 78,028 | 130,054 | 209,924 | 326,689 |

*Adapted from Angel et al 2011:48, Table 4.4)*

Land cover is thus likely to grow far more rapidly than growth in SSA's urban population. In addition, small cities are currently less dense (by roughly half) than large cities and can also expect to see significant expansion as well as densification.

The process and implications of urban expansion in SSA as for the rest of the world, raises questions that planners and decision makers as well as the urban communities they serve will need to consider and address. From an urban planning perspective, the understanding and accommodating of growth is ultimately reflected in the physical development and form of a city or town.

### Case Study 1 Urbanization and Urban Expansion in Ghana

Urbanization in Ghana has three drivers: natural population growth in urban settlements, permanent migration from rural to urban areas, and the reclassification of settlements from rural to urban as a result of the increase and spatial spread of the urbanizing population. In Ghana's case, natural population growth and reclassification are the dominant factors: the contribution of migration to urbanization was 55 percent during 1960 to 1970, 25 percent from 1970 to 1984 as Ghana suffered economic decline and came close to de-urbanising, and rose again to 37 percent between 1984 and 2000.

Around 40 percent of the increase of urban populations can be attributed to rural migrants, then, which contrasts to a commonly held perception, in Ghana as elsewhere, that migration is the key driver. In Greater Accra particularly, the contribution of migration to urban growth diminished from 17 percent in the earlier period to only 4 percent between 1984 and 2000, with according to the Ghana Statistical Services (GSS), which argued that "...urbanization has continued to be rapid in Ghana, resulting from the upgrading of former rural localities into urban status and the growth in most of the existing urban localities through natural increase." The results of the 2010 Population Census in Ghana will update this picture.

All three drivers are seen in different configurations in Ghana's large cities: between 1984 and 2000, Kumasi and Tamale both grew swiftly at a rate of 5.6 percent, Greater Accra at exactly the national urbanization rate of 4.6 percent, and Sekondi-Takoradi at an average 2.9 percent. When all metropolitan area population is included, Greater Accra's urban residents alone accounted for around a third of the urban population. The proportion rises to 45 percent when the other metropolitan settlements of Kumasi Metropolitan Area Sekondi-Takoradi and Tamale are added.

Strong urban growth was also seen in the 1984-2000 period in many smaller urban settlements. The relative proportion of urban population living in small towns of 5,000 to 50,000 people, which increased in number from 181 in 1984 to 347 in 2000, declined only slightly by 3 percent, from 49 to 46 percent of the urban population. More rural settlements crossed the 5,000 threshold for urban population. This included some newly-created district capitals, but the overall population in the small town category remained roughly the same.

Large-scale spatial expansion has accompanied urbanization. The built-up area of urban settlements is spreading rapidly – and extending outwards into areas which were considered as either peri-urban or rural. This is witnessed most clearly in metropolitan areas but is also visible in medium-sized and smaller settlements which appear to imitate the same spatial patterning and urban form. According to Angel et al (2005), the Accra Metropolitan Area's built-up area increased from 133 sq. km in 1985 to 344 sq. km in 2000. Making it a far bigger and less dense city. The built-up area per person increased at 3.8 percent a year, from 71 sq m to 123 sq m, while density decreased at 3.7 percent a year, from 14,120 persons per sq. km to 8,103 persons per sq. km.

Source: Bloch, 2011.

## 2.2 Urban structure and form

The overall urban expansion outlined for Africa above, is accompanied by changes in urban structure and in overall form. As seen above, and in and around Africa's larger cities in particular, fast-paced urbanisation is directly linked to large-scale spatial expansion, as cities and towns swell and most importantly grow outwards to accommodate population increases. Much of this is in the form of informal settlements in central and peri-urban locations, but new middle class suburbs are also rising on what were once seen only as peri-urban peripheries, and to a lesser degree, in central city locations through infill or land conversion. As previous municipal boundaries are crossed, and the distinction between 'urban' and 'rural' becomes further blurred, new spatial (and far less so, administrative) forms are emerging in the form of wider urban (i.e., city) regions or mega-city regions, and even wider and larger city corridors or city clusters (UN-HABITAT 2010).

The key new element here is the under-recognized emergence of Africa's new suburbs: a recent lower-density (at least compared to central cities) urban fringe area (or peripheral) suburban landscape (Bloch, 2011).

### Case Study 2 Africa's new suburbs

Within the picture of overall spatial expansion, new suburban development appears in a fashion akin to that of a colour spreading through water, diffusing from and through the existing urban fabric into peri-urban and rural areas. The process, which can appear random, combines and arranges together areas of intensive development and increased density with lower density areas. The densifying areas include real estate developer designed and constructed new-build, retail, commercial and industrial space, sometimes mixed use, the replacement of earlier residential uses with commercial uses in older suburban areas, and the rampant building of high-end infill residential. Simultaneously, residential development at lower densities – estates (some gated), and owner-built individual houses – catering broadly for a segmented middle-class rolls out horizontally into the far distance, colonising urban fringe areas and/or previously agricultural land on the peri-urban frontier.

Urban infrastructures, notably arterial roads as transportation corridors, serve as key structuring elements, fixing together particles (or better, globules) of built development.

These infrastructures – they can also include telecommunications, water, sanitation, electricity – create a network (or grid) of connections across suburbanising space. At points of denser intersection, nodes (literally knots) of more intensive, sometimes congested and often specialised land development (which can be formal and informal markets, shopping mall/office complexes, educational and other government facilities, formal and informal industrial production zones) come up. These nodes act as ‘anchors,’ which can further thicken and develop into new centres of activity that create new central functions to serve the immediate vicinity, wider areas of the new suburbs, and indeed the city as a whole.

This has started, in the last decade or so, to create a more (and truly) polycentric urban form with multiple (and shifting, as older centres decline and new ones emerge) functional cores.

This is a landscape of production, reproduction and consumption, and is interpenetrated by open spaces of various kinds (unused land, natural features, formal recreational areas), and often lies in close adjacency to other, poorer informal or slum residential areas which are still preponderant, and which spatially concentrate the urban poverty which is still the principal social and economic feature of African cities and towns. Visible in Southern Africa since the 1980s, it can be seen emerging in many larger African cities – e.g., Accra, Nairobi, Lagos – and is accompanied at the wider regional or even national scale by wider “urban field” spatial forms such as urban regions (South Africa’s Gauteng province being the best-known example, with others in Nigeria, Ghana and Kenya) and urban corridors (such as that connecting Abidjan, Accra and Lome).

Source: Excerpted from Bloch, 2011: 16-17.

The process of expansion and change in the built environment and urban structure now occurring in SSA, as elsewhere, is often characterized as ‘sprawl,’ which is defined by a leading scholar of the process as “low density scattered urban development without systematic large-scale or regional land-use planning” (Bruegmann, 2005: 18).

The foremost current paradigm for planning and managing urban form seeks to counter sprawl in the cause of overall urban sustainability by promoting a higher-density, bounded city or town form. Various terms are used: containment, or urban intensification, or densification, or an urban design approach – because as Todes points out (2008), it tends to use design elements such as nodes or corridors to structure urban space -- the approach is associated with the promotion of an overall more compact urban form. Williams puts it well here: “the dominant idea of the contained, compact, well-connected city prevails to some extent in most planning and city management policies in developed countries” (2007:1). Increasingly it is being considered or applied in other urban developing country contexts.

Broadly, the theory and practice of the compact city seeks to limit or bound urban expansion and advocates higher density living. As Williams and Sharro (2011) state:

The idea of the ‘compact city’ broadly advocates limited car use and greenfield development, encouraging the recycling of land, and promoting dense city developments, as well as walking and cycling. It reflects the environmental anxieties that dominate public debate these days, but also represents a form of nostalgia for a more traditional city form.

The compact city is positioned within an argument that through densification and reducing their urban footprints, cities or urban areas can become more sustainable. The argument for compact cities is also situated within a preference for more traditional city forms where there is a strict and reinforced urban hierarchy within a contained boundary.

There is huge debate here. Authors like Angel et al who argue for an evidence-based rather than theoretical (or ideological) approach to the challenges of urban expansion, put forward credible arguments on why containment may not be well-suited to the growth dynamics of African cities:

It may well be that containment is suitable in some cities, where population growth has subsided and where densities are already too low to sustain public transport, yet unsuitable in others, where population growth is still substantial and where higher densities and lower levels of car ownership can sustain public transport (2011:4).

Angel et al propose instead an alternative “Making Room” paradigm, which is “grounded in the conviction that we need to prepare for the sustainable growth and expansion of cities in rapidly urbanizing countries rather than seek to constrict and contain them” (ibid). In practical terms, they suggest planning for large-scale urban expansion areas, which would be provided with and structured by the layout of bulk infrastructure services, notably water and sanitation, and transportation networks.

Throughout these discussions, there is also an argument around community development, and about which urban form is more conducive to developing an environment whereby communities can ‘flourish’ and there is a strong sense of society. Suburban development is often criticised as encouraging socially disjointed communities through the development of closed communities, car dependency and an urban form that is low in density and in turn reduces the ‘opportunity’ for residents to converge or interact. Conversely, the compact city is presented as a high density environment where residents regularly converge and engage and as such develop a ‘community spirit’. As with the rest of the debate, both arguments are contested amongst scholars and practitioners and are based on assumptions of how and why residents develop relationships and participate in society. Arguments over the role of design in both compact cities and urban expansion are also central to this debate of community – particularly, that through urban design planners and decision makers can influence how people engage and respond to their urban areas.

For our purposes, the importance of community and an understanding of principles of good design are important. But our principal concern is with another, connected fundamental function of urban planning, which is about “the provision of services and infrastructure that allows a modern society to develop” (Sharro 2011) and more specifically, the integration of urban planning with urban water management.

## 2.3 Urban risks

The previous sections discussed the ways in which urban settlements evolve and new spatial patterns emerge in SSA. This section revolves around the interaction between urban expansion, urban form and risk. Environmental degradation and pollution poses significant health risks to the urban population. Additionally, urban areas are often located in hazard-prone locations such as low-elevation coastal zones, which are at risk from sea-level rise, or other locations at risk from flooding and extreme weather events (OECD, 2009; WDR, 2010). These risks will likely further increase in the future due to climate changes. Yet, there is no direct correlation between urbanization and risk, as there are a range of factors that intercede (e.g., infrastructure and basic public service provision as well as institutional arrangements). Rather, there is a correlation between a specific *process* of urban expansion and risk. These issues are discussed below.

### 2.3.1 Health and environmental risk

The most widely cited problem in the water sector in SSA is the contribution of unsafe water and lack of sanitation and hygiene to the increased incident of diarrhoeal diseases. According to the World Health Organization (WHO), 88 per cent of diarrhoeal deaths in the world are caused by unsafe water, sanitation or hygiene, with overall, more than 99 per cent of these deaths in developing countries, and around 84 per cent of them occurring in children (WHO 2009).

Epidemiological studies suggest that improved sanitation would contribute considerably to the efforts to reduce infectious diseases, and linked to this, also malnutrition (Schwarzenbach et al. 2010). For example, in Cameroon, children from households in slum areas without access to clean water and improved sanitation feature a much greater incidence of diarrhoeal diseases than those living in non-slum urban households (33.3 per cent compared to 9 per

cent) (UN-HABITAT 2008). Nevertheless, according to a pilot study carried out by WHO, only 37 per cent of the total aid to the sanitation and drinking-water sectors combined are directed towards improved sanitation (WHO 2008).

The increases in solid waste and wastewater generated in urban area places further pressure on water quality and on urban drainage. This further complicates efforts to secure adequate supplies of clean water. Moreover, uncollected waste may accumulate on the streets and clog waterways and drains when it rains, which can cause flooding.

In Sub-Saharan Africa, the issue of water problems associated with various industry sectors, and particularly the mining industry is a very important but under-researched one. Negative externalities associated with mining activities include contamination of ground and surface water, which poses serious risks to the natural environment and the public health. Mining-related pollution problems may persist for many years, even after the activities have ceased. Thus, the mining-related pollution in particular, as well as industrial pollution in general, should not be underestimated. Simon (2010) for example, highlights the fact that Lagos in Nigeria, Cotonou in Benin, and Accra in Ghana, all suffer heavy pollution from industry, sewage and dumping of solid waste.

Extreme weather events also increase urban health risks. As Kovats and Akhtar (2008) point out, scientific evidence indicates that current weather extremes have significant impacts on public health, particularly the impacts of heavy rainfalls, floods and heat waves. For example, Kano in Nigeria and Ouagadougou in Burkina Faso, are particularly vulnerable to heat waves, as they experience heat stress and related problems during the summer seasons. Johannesburg in South Africa, Brazzaville in the Democratic Republic of the Congo and even several desert cities in Burkina Faso and Niger have also become more vulnerable to flooding from sudden river surges following extreme weather events (UN-HABITAT 2010).

Potential risks to human health caused by increases in extreme weather events such as floods and droughts include deaths from thermal extremes and weather disasters, vector-borne diseases, a higher incidence of food-related and waterborne infections, photochemical air pollutants, deterioration of freshwater resources (WHO 2009).

### Case Study 3 Water Quality in Suburban Dakar

In the urban region of Dakar, Senegal, approximately 80% of water resources come from groundwater reservoirs, which are increasingly affected by anthropogenic pressures. The identification of the main sources of pollution, and thus the aquifer vulnerability, is essential to provide a sound basis for the implementation of long-term geochemically based water management plans in this Sub-Saharan area. Dakar, as well as other African coastal capitals like Abidjan, Lomè, Lagos, or Dar es Salaam, is characterized by an increase of nitrates and other contaminants in groundwater (Abiodun 1997; Showers 2002; Oga Yei et al. 2007; Akouvi et al. 2008), strongly associated with seawater intrusion processes. This underlines the fact that problems associated with rapid urbanization, inadequate sanitation, lack of alternative water supplies, and lack of public awareness and implementation require urgent addressing. Anthropogenic inputs of nitrogen from human activities are a central concern in urban watershed management.

Source: Quote from Re et al. 2011: 605

During flood events in particular, the contamination of surface water and its impact on the environment and the health of urban population is an important issue. Such events are linked with increased rates of infectious diseases for the urban populations. Increases in cholera, cryptosporidiosis and typhoid fever have also been reported in low- and middle-income countries after heavy rainfalls (Kovats and Akhtar 2008; Ahern et al. 2005).

In 2000, the direct impacts of heavy rains caused by cyclones in Mozambique killed 700 people and left 500,000 homeless. Indirect impacts, such as the damage of pit latrines, and the overflowing of 3,000 septic tanks in the cities of Chókwe and Xai-Xai, aggravated the

impact of the disaster by affecting public health. With climate changes, weather events of this kind will become more likely and intense in the future, and thus, their indirect health impacts in urban areas cannot be ignored (Dodman 2009). Nevertheless, health experts highlight the fact that attribution of climate change to health risk is based on models with considerable uncertainty.

Table 2.2 below summarizes the known impacts of weather and climate events on urban health.

Table 2.2 Summary of known effects of weather and climate on urban health

| Health outcome                                                      | Known effects of weather                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Heat stress                                                         | <ul style="list-style-type: none"> <li>Deaths from cardio-respiratory disease increase with high and low temperatures</li> <li>Heat-related illness and death due to heat waves</li> </ul>                                                                                                                                                                                                                                                                                                                                       |
| Air pollution-related mortality and morbidity                       | <ul style="list-style-type: none"> <li>Weather affects air pollutant concentrations</li> <li>Weather affects distribution, seasonality and production of aeroallergens</li> </ul>                                                                                                                                                                                                                                                                                                                                                |
| Health impacts of weather Disasters                                 | <ul style="list-style-type: none"> <li>Floods, landslides and windstorms cause direct effects (deaths and injuries) and indirect effects (infectious disease, loss of food supplies, long-term psychological morbidity)</li> </ul>                                                                                                                                                                                                                                                                                               |
| Mosquito-borne diseases, tick-borne diseases (e.g. malaria, dengue) | <ul style="list-style-type: none"> <li>Higher temperatures reduce the development time of pathogens in vectors and increase potential transmission to humans</li> <li>Vector species require specific climatic conditions (temperature, humidity) to be sufficiently abundant to maintain transmission</li> </ul>                                                                                                                                                                                                                |
| Water-/ food-borne diseases                                         | <ul style="list-style-type: none"> <li>Survival of important bacterial pathogens is related to temperature</li> <li>Extreme rainfall can affect the transport of disease organisms into the water supply. Outbreaks of water-borne disease have been associated with contamination caused by heavy rainfall and flooding, associated with inadequate sanitation</li> <li>Increases in drought conditions may affect water availability and water quality (chemical and microbiological load) due to extreme low flows</li> </ul> |

Source: Kovats and Akhtar (2008)

### 2.3.2 Natural hazards risk

Many recent studies have pointed out the ways in which urbanization and urban growth is linked to increased vulnerability to natural hazards. In the 2007 UN-HABITAT Global Report on Enhancing Urban Safety, it is pointed out that urban areas are ‘inherently risk prone’ due to the high concentration of infrastructure and people. At the same time, urbanization drives local and regional environmental changes by altering land cover, hydrological systems, and biogeochemistry (Seto et al. 2009). This generates new hazards, thus making cities and towns ‘disaster hotspots’ (UN-HABITAT 2009). For example, deforestation and slope instability can be manifested as landslides and flash flooding.

Hence, it is the very characteristics of cities and towns in SSA, such as their structure and form, and socio-economic factors that will affect the way in which natural hazards may impact upon them. The urban poor in particular, which lives in informal settlements, are experiencing increased vulnerability to disaster risks as they often live in the most risk-prone and congested locations and at the same time lack access to adequate service provision, including access to water services.

The issues highlighted above imply the importance of recognizing that city morphology as well as local socio-economic factors will play an important role in identifying appropriate urban planning strategies for increasing urban resilience. It is not urban development *per se* that increases vulnerability to disaster risks but the fact that urban growth and urban expansion takes place without having first put in place adequate planning systems, including distinct land uses and disaster mitigation plans.

Droughts and floods are responsible for 80 percent of loss of life and 70 percent of economic losses linked to natural hazards in Sub-Saharan Africa (World Bank 2008). Since the 1980s the number of natural disasters in Africa has tripled, reaching an average of 60 disasters per year during the 2000s, a quarter of which were flood events (Ibid.). Although this increase is driven by a combination of natural and human-induced factors, such as those associated with urbanization, recent reports (i.e., IPCC AR4; US Climate Change Science Program 2009; US National Academy of Sciences 2011; Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation 2011) acknowledge that a warmer climate will result in more frequent and intense weather events thus further increasing disaster risk.

Flood risk in particular, is an increasingly important issue, as urbanization and climate change will increase the impacts of urban flooding. A recent study on the topic indicates that disaster statistics appear to show flood events are becoming more frequent, with medium-scale events increasing fastest (Jha et al. 2011). Further, urbanized African coastal areas are among the regions that expected to experience the highest incidence of additional flooding due to sea-level rise with more than one million people directly affected every year (Nicholls 2004). Dakar, Lagos, Cape Town, Maputo, and Mombasa all have many low-lying areas that often concentrate poorer urban residents which are particularly at risk from sea-level rise. Types of flooding in urban areas can be categorized as (ActionAid 2006):

- Localized flooding that may take place all round the year and mainly affects people living in informal settlements and slums because of lack of adequate urban infrastructure, such as are drainage or solid waste management.
- Small streams in urban areas that can rise quickly following heavy rainfall events and pass through culverts under roads. Although if they are adequately designed and the channels have less debris in them they will be more effective.
- Major rivers flowing through urban areas. In this case land use changes and engineering works upstream will play an important role and exacerbate the impact of flooding. Urban growth and expansion in floodplains also increases flood risk.
- Flooding in low-lying and coastal cities and towns during the rainy season may affect some areas for two or more months.

#### Case Study 4 Floods and Coastal Hazards in Urban Areas

Africa's cities are often in areas exposed to risk which is exacerbated by limited urban planning. In Dakar, Senegal, for example, new and informal settlements on the city's outskirts are regularly affected by flooding. A recent study assessed hazards of floods, coastal surge, and sea level rise in the city and its surroundings. Applying the Climate Change Cities Primer framework, the study assessed the relative flooding potential, coastal inundation, and coastal erosion in a spatial assessment, and identified hotspots of high population increase in high-risk areas.

The coastal twin cities of Inhambane and Maxixe, Mozambique, face a similar problem. The Analysis of the Urban Vulnerability to Climate Risks in the Cities of Inhambane and Maxixe has identified flood and coastal surge hazards and highlighted possible strategies to be addressed in urban development. Special attention was given to the role of urban (spatial) planning and active participation of its inhabitants.

Source: Quote from World Bank, 2006:16

The structure and form of urban areas may increase the risk and vulnerability of urban settlements and may also create what Allan Lavell has called 'concatenated hazards', where a primary hazard leads to a secondary one (Satterthwaite et al. 2007). For example, floods that may trigger water supply contamination. Lall and Deichmann (2011) point out that the high concentration of people and economic assets in rapidly urbanizing cities and towns will inevitably cause further increase of hazard risk. Hence, it is important that policy- and decision-makers bear in mind the non-climatic factors exacerbating disaster risk.

Despite the efforts to reduce disaster impacts in general and flood impacts in particular through DRR in Sub-Saharan Africa SSA, according to the 2011 Global Assessment Report on Disaster Risk Reduction (GAR11) flood mortality risk in SSA is still growing, indicating that exposure to hazard risks continues to outpace reductions in vulnerability.

It is important to note however that there is no direct link between increasing urban populations and increasing disaster risk (Dodman 2009). Experience from high-income countries and some middle-income countries shows that urban growth and expansion can take place without increasing hazard risks. This is in line with the fact that disaster risk is most times concentrated within low-income populations or within city districts with high concentrations of low-income groups. These are often among the most densely populated sections of urban centres and include informal settlements and slums (Ibid.).

### 2.3.3 Climate change and variability

Factors adversely contributing to Africa's vulnerability to climate change, incorporating variability and extremes, include poverty, weak institutional arrangements, limited access to infrastructure and technology, overexploitation of land resources, population pressure, desertification, and land degradation (UNFCCC 2007). Climate change is likely to impact upon the water sector in the form of floods, droughts, saline intrusion, among others, with major impacts on households, key economic sectors in Africa, such as agriculture and industry, on irrigation, human settlement patterns and movement, water supplies and sanitation and human health.

In Africa, the number of people at risk of increased water stress by 2020s is projected to be between 75-250 million and 350-600 million by the 2050s (Boko et al. 2007). However, the impact of climate change on water resources across the continent varies. While an increase in the number of people who could experience water stress by 2055 in northern and southern Africa is very likely, in eastern and western Africa more people will be likely to experience a reduction rather than an increase in water stress (Ibid.).

The regional differences of the impacts described above, along with the inherent uncertainties associated with climate change, creates a quite complex context that urban planning responses will have to take into account. The fact that most climatic estimations exist at the macro level pose additional difficulties for urban planning and water management at the local level. The availability of local data about potential hazards and future impacts of climate change and variability remains a big challenge.

The way in which climate change will impact upon areas will depend, as described earlier, on their very characteristics. Inland urban areas in Sub-Saharan Africa face diverse risks, ranging from floods, rising temperatures and desertification to threats to the security of water, and food and fuel supplies (Simon 2010). For coastal areas, sea-level rise will be the most important problem. Coastal areas are also particularly exposed to tsunamis, storm surges and erosion.

In the IPCC AR4 it is pointed out that even a small increase in the global average temperatures will result in more floods and storms, while temperature increases of 3°C and more could result in the loss of about 30 per cent of global coastal wetlands (IPCC 2007). It has been estimated that although only 2 per cent of the world's land area is LECZ<sup>3</sup>, it contains 10 per cent of the world's population and 13 per cent of the world's urban population (McGranahan et al. 2007).

In Africa, more than half of the urban population is located within or have parts within low-elevation coastal zones (Dodman 2009). Concentration of urban population in coastal areas is mainly caused because of the opportunities that arise from transportation and trade. At the same time however, urban disaster 'hotspots' are disproportionately concentrated in the same low elevation coastal areas. Mombasa in Kenya for example often experiences coastal flooding that result to damages in private and public properties and infrastructure, loss of

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<sup>3</sup> Low Elevation Coastal Zone (LECZ) is land adjoining with the coastline up to a 10 metre elevation.

human lives, as well as increased incidence of diseases such as cholera and typhoid. It is estimated that a sea-level rise of 0.3 metres could potentially affect approximately 17 per cent, or 4,600 hectares of Mombasa's land area (Awuor et al 2008).

### Case Study 5 Climate Change Impacts with Water Security

Kano, Bulawayo, Dodoma and Naivasha are prominent African city examples already at the margins of sustainability in terms of water supply. GEC is very likely to exacerbate their problems (Simon 2010). In Kano's case, any further modest southward shift in the transition zone from the Sahara Desert to well watered intensive agriculture will imperil the city's food security and water supply. Located in the semi-arid zone of southwestern Zimbabwe, Bulawayo has already been beset by chronic water shortages for years (*Business Report* 2007; Gwebu 2002; Musemwa 2006), although this is at least partly due to political factors that have delayed investment in new supplies

Source: Quote from Simon 2010:8

### 3 Urban Planning Theory and History of Planning in Sub-Saharan Africa

#### 3.1 Urban planning theory

There are many definitions for urban planning focused on the allocation and development of land. This paper adopts the position expressed in UN-HABITAT (2009) that “‘planning systems’ refer to a collection of agencies, procedures, instruments and protocols that are often sanctioned by the formal state, backed by formal law, and linked especially to rights to develop and use housing, land and property.”

Here we differentiate between spatial planning and land use planning. Land use planning (also often known as physical planning) typically refers to the detailed planning of the ways in which buildings and land are used. It usually incorporates the regulatory dimension by which land use is overseen. Spatial planning is usually seen as a wider set of ideas and practices which give geographical expression to a society’s social, economic and other policies. Spatial planning thus takes place at the strategic level of overall guidance and encompasses land use planning.

#### 3.2 Rational comprehensive planning

UN-HABITAT (2009) notes that ‘urban planning is as old as human settlement itself’ and this is evidenced by the discovery and analysis of ancient settlements in the Middle East, North Africa, Latin America, Asia and Sub-Saharan Africa. The form and manner in which urban planning is undertaken reflects the main body of this section of the paper and is largely centred on the development and approaches adopted from the 19<sup>th</sup> Century.

Industrialization in Western Europe and North America in the 19<sup>th</sup> Century marked a turning point for the development of urban areas. The rapidity of change, environmental degradation, pollution and diminishing living and health standards spurred action and provided the foundation for what is usually termed modernist planning.

Modernist planning was influenced by two factors: technical and ideological (Benevolo as cited in UN-HABITAT, 2009). The prevailing technical approach during this period was in response to the negative impacts of industrialisation and urbanization, framed in health terms, which largely meant the segregation of incompatible land uses such as industry and residential. However, despite the stated well-intentioned ‘public health’ objectives, often, the approach was more political and enabled the powerful to reaffirm their position and protect their interests by maintaining property values through land use segregation.

Principles of modernist planning can be delineated by three main periods. The three periods include the formative years from 1800-1910 which included movements such as the Garden City Movement, City Beautiful Movement and the Public Health Reform Movement, followed by the period between 1910-1945 whereby planning became institutionalised and recognised as a professional vocation, and a third period marking the post-World War II era characterised by standardisation.

The comprehensive rational planning which emerged operates on rational technocratic decision making principles that commence with a situation analysis, forecasting, problem identification, formulation of goals, analysis of alternate courses of action and moves systematically to implement selected course of action and monitor implementation of action towards achievement of set goals (Conyers & Hill, 1984; Rakodi, 2011; Egbu, 2007 as cited in Awuah, 2010). The practical translation of this process is the preparation of master plans, structure plans, infrastructure plans and action plans for particular geographic areas. These plans provide the spatial framework for development and can be prepared at various scales from strategic high level spatial plans through to detailed land use plans.

The content of plans varies depending on the types that are being prepared. Structure plans and infrastructure plans provide the broad development framework highlighting the location

of infrastructure and general areas for particular land use(s). They do not provide detailed planning guidance on plot size or building envelopes and provide the high level structure or framework for development to occur. Master plans can provide greater detail combining the information of both infrastructure and structure plans to prepare a more detailed development framework. This includes location of infrastructure, definition of land use(s), and plot sizes; it can also include finer details such as landscaping, building envelopes and car park details. The relationship between plans is referred to as a hierarchy of plans and reflects the comprehensive rational planning approach.

The level of 'comprehensiveness' and/or ability for relevant authorities to prepare and implement plans has always varied, affecting how urban areas develop and cope and respond to change. In addition, comprehensive planning has been criticised for producing static development plans incapable of being responsive or dynamic and for its top down approach. However, rational planning offers planners and decision makers a process whereby planning for both current and future requirements can occur. This is particularly pertinent to infrastructure planning and to the integrating of such considerations into land use planning practice.

### 3.3 History of planning in Sub-Saharan Africa

The influence of colonisation in Africa on land use planning is still evident today in the planning systems of many SSA countries.

Land use planning practice and policy was dominated by the influence of European settlers and the colonisation of Africa in the Nineteenth Century predominantly by the British, French, German, Belgian and Portuguese (Awuah et al, 2010). This process saw the importation of European ideals and approaches to how land is organised and managed. The manifestation of this was reflected in the physical attributes of settlements in the layout of urban areas, building design and also planning legislation, planning regulations, planning policy and governance frameworks that facilitated development. The legacy, as Berrisford (2011), notes is that planning law inherited from the colonial power remains on the statute books, largely unchanged.

At the time of colonisation earlier trading outposts became the centre around which colonial towns and colonial administrative centres developed. These towns were typically located on the highest elevation and separated by a considerable distance from the residential areas of the indigenous population. (Njoh, 2009) This in combination with colonial authorities desire to recreate European style and standards in urban development and buildings shaped planning legislation, spatial design and built form architecture. The extent to which authorities went to replicate the European ideal evident not only in building design but also the materials used such as cement, glass and steel all of which were sourced and part assembled in Europe and then shipped to relevant colonial settlements for further assembly and construction. This approach considered by the colonists as one means of 'modernising' the 'backward' Africans (Njoh, 2009). The geography of these colonial settlements and siting of residential accommodation for the colonial rulers at elevation was also considered a means of 'overseeing' the indigenous population. Further discussion on how this approach was adopted in planning policy will be described in the following section.

To achieve the desired form of development within Africa, colonial authorities enacted municipal codes that were already in force in Europe (Njoh, 2009). Zoning, the mechanism employed to separate land uses and create order on the basis of complementary uses and function, stemmed from European land use planning practice of the early 1800s largely, as seen above, as a means of segregating potentially conflicting land uses (Njoh, 2009).

The approach of zoning and separating land uses was widely adopted throughout Africa at the turn of the nineteenth century (Myers, 1998 as cited in Njoh, 2009). Within the colonial context, support for zoning as means of maintaining segregation of particular land uses was by and large, the primary means in which colonialists separated indigenous populations from the white settlers. Njoh (2004 & 2009) has written extensively on this method of planning as a means of reinforcing power relations and subjugating native inhabitants.

Through the enactment of municipal codes that replicated European practices, the administrative process for development was also mirrored. This meant that all building activities, including alterations to existing structures, had to be approved, through the granting of a building permit, by the colonial government (Njoh 2009).

In addition to zoning, master plans used as a tool to regularise land use, control growth and development and provide an ordered structure in which colonial settlements could function. Master plans can be described as a template and a means to express spatially how and where development should occur. That is, they present graphically the desired form of development, outlining road networks and other infrastructure and incorporating principles of zoning by showing clearly where residential development should be located, where town centre facilities such as shops and government offices will be and also other land uses such as open space, commercial and industrial development. A master plan(s) therefore, represented the vision of the colonialists for how settlements should be developed. The subsequent implementation and management facilitated by the enacted municipal codes and legislation that as noted by Berrisford (2011) remain today, largely unchanged in many parts of Africa.

Table 3.1 presents a partial view of the chronology of legislation and plan making.

Planning Legislation Chronology and Prepared Master Plans

| Country                                    | Legislation/Master Plans                                                                     |
|--------------------------------------------|----------------------------------------------------------------------------------------------|
| Ghana                                      | Town Ordinance of 1892 followed by the Town and Country Planning ordinance 1945              |
| Dahomey (now Republic of Benin)            | Urban development plan for capital, 1890                                                     |
| Doula, Cameroon                            | First urban plan for city, 1890                                                              |
| Kenya                                      | Town Improvement Ordinance 1893 and Town Planning Ordinance 1936*, Nairobi Master Plan, 1910 |
| Conakry, the capital of present day Guinea | First Urban Development Plan, 1895                                                           |
| Northern Rhodesia (Zambia)                 | Town Planning Ordinance 1929*                                                                |
| Zambia                                     | Lusaka Master Plan, 1933**                                                                   |
| Ghana                                      | Accra Master Plan, 1944                                                                      |
| Nigeria                                    | Town Planning Ordinance of 1946*                                                             |
| Tanzania                                   | Town Planning Ordinance 1956*                                                                |

\*All passed along lines of British Town Planning Acts of 1932 and 1947

\*\* The development of this plan influenced by the Garden City Movement by S.D. Adshead, at the time, Professor of Town and County Planning at the University of London.

Njoh (2004 and 2009) explains that the French involvement in town planning and spatial development policy making in SSA predates France's adoption of territorial colonialism. This is because it was not until 1945 when laws on the built environment in metropolitan France were broadened to cover the colonies. Prior to this the control of urban developments in the French part of SSA was in hands of territorial governments and limited to the passage of legislation emphasising hygiene, security, safety and aesthetics. The adoption of zoning and master plans as the means of ordering and managing the urban area already clearly in place in the colonies and the foundations of which were, as detailed above, rooted initially in public health principles. The approach to planning and adoption of land use segregation therefore not being contrary to the initial mandate of the territorial governments.

The period around the Second World War marked, as detailed in the table above, the enactment of planning legislation within SSA. The Colonial Development and Welfare Act of 1940 for British Colonies and the Fund for Economic and Social Development (FIDES) instituted in French colonies in 1946 positioned land use planning as ‘comprehensive activity of government’. The planning principles reflected in the enacted legislation around this time were rationalist and continued to use master plans and the concept of land segregation (Awuah et al, 2010).

Underpinning the planning system and the colonial authority’s ability to develop land and issue relevant permissions were the actions taken in regards to land tenure. Communal ownership of land whereby the value of the land was tied to its use and the value could not be converted to a financial or market value and the sale or transfer of land was forbidden represented the land tenure system within Africa prior to the arrival of European colonialists (Njoh, 2009). The colonial era saw the introduction of wholesale amendment to the traditional land tenure system. The Torrens Act introduced in Australia recognised land rights as completely separate to human rights and instituted an official land register in which all transaction in the land had to be entered (Njoh, 2009). Amendments based on this system as well as other French and German legislation effectively designated the colonial state as the sole custodian of all land in colonial Africa (Njoh, 2009).

A central part of the land reform actions by the European colonial authorities was the principle of ‘unoccupied or ownerless lands.’ The European colonial authorities determined that any land deemed unoccupied or ownerless became property of the colonial state. The introduction of this law as part of the land reform was entirely at odds with the traditional African land tenure system which considers land communal and the present occupiers as custodians. Reforms introduced by the colonial authorities in regard to land tenure commodified land and sought to endow the administration with as much land as possible with little regard to traditional values or systems (Njoh, 2004).

## 4 Contemporary Planning Practice

### 4.1 Contemporary planning practice in Sub-Saharan Africa: An overview

Planning regimes within SSA with a few exceptions remain largely unchanged since the colonial era. Since independence attempts to reform land use planning regimes yielded few results (Awuah et al, 2010). Since the late 1970s there have been attempts to reform planning legislation, initially, the World Bank through linking its lending agreement with review of planning regulatory regimes and the on-going UN-HABITAT Agenda's Globalised and Internationalised reform programme from the 1990s (ibid). The objectives of reform programmes to modernize, streamline, simplify and improve the urban planning system are often severely constrained and/or ineffective as previous legislation is not repealed, there is disconnect with other legislation and/or conflict between departments or agencies arise over roles and responsibilities. This, coupled with limited budgets and staff capacity, all contribute to planning regimes that continue to reflect historic systems and in many instances struggle to address and meet contemporary demands and pressures.

Exemplifying current challenges and lack of integration within the planning system is Nigeria. As recent study in Ondo State (Aribigbola, 2007 as cited in Awuah et al, 2010), highlighted that while the Federal Government of Nigeria is responsible for enacting land use planning legislation, the state government can also legislate on urban land use planning provided it is not in conflict with federal legislation. Further while local government are involved in the planning they lack the capacity to approve master plans and other planning schemes; the responsibility for that being with the state government. The public are not involved in the planning process while developers are required to adhere to the standards and process for receiving permission established under the colonial regime.

Reforms attempted in Ghana provide another instructive example of the challenges faced in contemporary Africa. The Government of Ghana passed the Local Government Act in 1993 followed by in 1996 by the national building regulations. The Local Government Act sought to review to decentralise planning focussed only on policy planning yet the building regulations remained largely unchanged from under colonial regime including being stated as British standards. Finally, as the old land use planning ordinance was not repealed it ran in parallel with the newly introduced legislation. All these mechanisms run at odds with one another and contrary to an integrated system.

This story can be told for most African countries. Along with a lack of investment in human resources and technology in planning offices, particularly at local levels as the overall systems tended to remain the province of central government ministries, the result has been disillusionment with the prevailing rational comprehensive planning theory and its outputs, which are typically associated with master or structure plans. In the face of resource and capacity constraints, these took a long time to prepare – and were then seen as rigid and inflexible, hampering their implementation. A gap or vacuum opened at the strategic, spatial planning level. Despite the development of alternatives, such as the Cities Alliance's City Development Strategies, which placed emphasis on city economic functions and promotion, this vacuum remains. Detailed land use planning still occurs under the imprimatur of the state, but does not remotely cover most urban development, whether formal or informal. Increasingly, it is handed over to private developers, who have their own specific interests.

South Africa provides an alternative narrative having adopted an integrated approach to urban planning. The South African experience is characterised by the legislative reform of the post-apartheid era. Within the planning context this period saw the introduction of the Integrated Development Plan (IDP). In 1998 the White Paper on Local Government was released setting out the principles and proposed arrangements for the new system of local government - with a focus on decentralisation. The White Paper confirmed the status of IDP's as being critical for developmental local government (Harrison, 2006).

IDPs represent a plan, prepared by local, district or metropolitan municipalities for a five year period (coinciding with the term of the elected council). The plan sets out the priorities

and activities of an elected municipal authority and includes a spatial component through the inclusion of a Spatial Development Framework – as a high level spatial plan that includes direction and guidelines for land use management rather than a detailed land use plan. The role of IDPs therefore is to provide a long term vision for a municipality; setting out the priorities of an elected council; linking and coordinating sectoral plans and strategies; aligning financial and human resources with implementation needs; strengthening the focus on environmental sustainability; and providing the basis for annual and medium term budgeting (Harrison, 2006).

South Africa's approach here centred on integrated and "joined up" government whereby strategic documents permeate through all operational plan(s) and are linked to human and budgetary resources. For urban planning, Local Government is positioned as the principal body to deliver planning and development outcomes. The implications for urban planning have continued to evolve and as Harrison 2006, notes, by 2000 new forms of integrative spatial planning was beginning to emerge in South Africa influenced by the IDP framework.

## Case Study 6 Uganda

Scaff (1965) as cited in Mukwaya et al (2010):

*...town life in Uganda is new, being introduced with the coming of the British in the later years of the nineteenth century and the establishment of Kampala following Lugal's military adventures in 1890. The major structure of the towns bears the stamp of the British rule during the period of its protectorate. The larger towns were gazetted for European and Asian occupancy, meaning that they could lease land and engage in enterprise in these centres; while the smaller places were limited to African ownership and trade. The large towns, such as Kampala and Jinja, are therefore largely non-African creations and still occupied disproportionately by non-African residents; while the African population is concentrated around the fringe outside the centre where land use is more highly controlled and restricted.*

Uganda's experience of urban planning captured in the above quotation as one largely influenced by colonial rule and segregation has undergone several incarnations. Colonial rule in Uganda saw the construction of the Uganda Railway which greatly influenced the spatial pattern and development of Uganda. This coupled with the introduction of legislation and regulation to determine, segregate and control particular types of land uses within township areas based on British standards had little regard for local customs and systems of land settlement and local governance (Mukwaya et al 2010).

The civil unrest of that characterised the 1970s and 1980s expedited the degeneration and collapse of urban areas and collapse of economic conditions, expulsion of major property owners and diminished institutional capacity of urban authorities. This period saw a shift in government thinking towards urban planning and a move toward master planning for major towns. Despite a series of recommendations for the development of urban areas that highlighted the need to establish a hierarchy of urban areas and integration with infrastructure planning – in particular water and sewage management and supply, many of these recommendations did not receive formal consideration. (Mukwaya et al 2010). The 1980s saw the introduction of the 'Enabling Policy' to address the growing challenge of housing provision. However, this policy drove private housing prices up and beyond the reach of the urban poor, meaning government houses degenerated into inhabitable places for the urban poor in several urban areas (Mukwaya et al 2010).

From 1986 more liberal economic policies of the central government have been adopted in an effort to encourage and stimulate economic growth. Ongoing urbanization pressures and the establishment of informal settlements that are not recognised within the planning system, coupled with environmental decline and growing urban poverty, are the backdrop to these reforms.

In 1997 the Local Government Act redefined urban areas and enables the Minister of

government to declare any areas to be a town council, municipality or city if the following criteria are met: (i) population level (town council 25,000 people, municipality 100,000 people and city 500,000 people) (ii) have the capacity to meet the cost of delivery of services; (iii) have its own offices; (iv) have a master plan for land use; (v) water resources are present; and (vi) where district headquarters are established, the area is declared a town council. A change now to internal boundaries and the limit of central government resources has meant small rural centres are now recognised as urban centres but without provision of appropriate services and infrastructure facilities (Mukwaya et al 2010).

The 2007 review of Uganda's urban centres undertaken by the Population Secretariat did not deliver a favourable picture of urban centres highlighting the financial incapacity of authorities and the lack of proper housing and sanitation facilities for the urban population. The national development agenda of the Government of Uganda and national urban campaign is in direct response to the lack of planning, burgeoning informal settlements and lack of urban services and a desire to regularise, order and manage urban areas. It also marks recognition that the urban plans prepared lack relevance and need to be reviewed and updated.

Uganda's response to these challenges and through the national development agenda is still to facilitate decentralisation, with exceptions such as Kampala where central government will take over the management role. This shift and increased role of central governments provides an interesting consideration for other SSA cities adopting a decentralisation approach.

#### 4.2 Strategic urban planning and national planning legislation

Strategic urban planning requires analysis and assessment of existing conditions to develop an understanding of the drivers of urbanization and to determine what the future needs of the community and residents of an area may be. This process of determining what the future needs may be represents the forward looking/planning process that underpins the strategic planning process.

Urban planning, however, is often understood only at the detailed level. For example, an individual wants to build a house and their experience is defined, particularly in the developing world, by the bureaucracy, time and contradictions of the planning process coupled with the challenges often experienced around obtaining land tenure rights. This experience is also punctuated with the sometimes onerous requirements to build a compliant building. However, strategic urban planning represents the critical first step in planning from which appropriate land use policy is derived and then translated into development frameworks and measures of control. It is often the case, as highlighted above, that the lower order planning, i.e., development control processes, is the preoccupation and focus of many planners and decision makers. It is also often the case, particularly in SSA that there is limited capacity, experience and will to adopt more strategic planning approaches (Berrisford, 2011). This over-emphasis on the detail and reduced or no consideration to the strategic level thinking of what drives cities and how and where they will develop is highly problematic.

Contemporary planning practice requires strategic planning to be an integral element of the planning process. Through forward planning and understanding the current situation of urban areas, strategic planning enables decision makers to prepare high level plans that set a development framework and integrates considerations such as land supply, infrastructure requirements and location (hard and soft), open space and areas for future expansion. Achieving integration requires a range of legislative and policy instruments to be in place. At the legislative level, the consideration of respective sectoral relationships, such as planning with water, power and transport, has to be understood at the highest level.

In the example of South Africa and as outlined in the case study below, enactment of legislation stipulated that IDP will at a minimum consider sectoral plans. This cross-

referencing or link up between different sectors is central to both strategic planning and integrated planning.

### Case Study 7 South Africa: Integrated Development Plans

As seen above, legislative reform in post-apartheid South Africa sought to decentralise government activities. The introduction of Integrated Development Plans (IDP) represented a shift in municipal governance toward more management and performance oriented criteria. The 1998 White Paper on Local Government positioned the IDP as an integral part of the legislative reform but moreover an essential instrument in the planning and management of local government activities. In 2000 the Municipal Services Act (MSA) specified the minimum contents of the IDP as:

- A vision for the long-term development of a municipality;
- An assessment of the current level of servicing, and of economic and social development in a municipality;
- The municipal council's development priorities and objectives for its elected term;
- The local council's development strategies (which must be aligned with any national or provincial plans);
- A Spatial Development Framework (which must include guidelines for a land use management system);
- Operational strategies;
- Sectoral plans required by other legislation (eg. Water plans, transport plans, waste management plans, disaster management plans and housing strategies);
- A financial plan; and
- A set of key performance indicators and performance targets

Although initially positioned as an instrument of local planning and coordination, the IDP is now linked in an intergovernmental planning system, with instruments such national government's Medium-term Strategic Framework and Provincial Growth and Development Strategies.

South Africa's effort to develop an integrated development framework is a useful example that highlights integration across legislative, strategic and detailed frameworks. Further, through adopting a management approach, the stated objectives are linked to both human and financial resource allocation – providing an operational and implementation framework.

Source: Harrison, 2006.

Some conclusions can be reached here. Despite the difficulties, as further seen in the Zambia case study below, designing legislation that recognises the fluidity of African cities but at the same time the urgent need to be able to effectively deliver services and shelter to residents *does* require greater and more effective government intervention in urban planning. This does not exclude participatory planning approaches but it does advocate that there is a place for comprehensive planning in order to respond to the growth that is driving African cities. This starts at the legislative level and flows through to embedding policy objectives, cross-institutional working and then the practical exercise of plan making – strategic including structural plans and concept plans and finally detailed land use plans. This process and its relevance to African cities remains in the ability for government to deliver essential services, adequate housing for the current needs of its residents while simultaneously looking to the

future, and having a framework in place that has considered development scenarios at the short, medium and long term and makes provision for this change.

### Case Study 8 Revising Spatial Planning Legislation in Zambia

During the 1990s Zambia revised the country's spatial planning and land development legislation which included the revision and rationalisation of the Town and Country Planning Act and the Housing Strategy and Improvement Areas Acts. At independence in 1964, Zambia inherited planning legislation that was based on the UK's 1948 Town and Country Planning Act. Zambia acted relatively swiftly in comparison to other African countries in a similar situation and introduced significant legislative change through the implementation of the Housing (Strategy and Improvement Areas) Act (Chapter 194 of the Laws of Zambia), 1976. This Act allowed for parts of a town or city to be excised from the planning system created by the Town and Country Planning Act (TCPA) and for a more rudimentary form of planning to be introduced in order to accommodate low income residential areas in the city. Areas under customary law applied by customary leaders is also excluded from TCPA requirements

As a result of this complexity of the application of laws governing planning land use, the government of Zambia deemed that the legal framework was neither efficient nor effective. Support via donors to undertake a pre-feasibility study on 'urban development' sector Zambia was followed by project design for legislative reform.

Implementation of the project started with the drafting of a new Act, but has been challenging. Using an accepted methodology and actively seeking engagement from government, public and industry, the project appeared to be progressing in an acceptable and timely manner. However, critical questions were beginning to arise – namely, why was the process going so smoothly?

In reflecting on this Berrisford, 2011 notes that what became apparent is that many of the underpinning assumptions informing the project were to prove incorrect. This included that stakeholders would read and provide detail comments on the proposed documents, that there was actually support for repealing and rationalisation of the current legislation, there was reliable data on the way the planning system worked, that the engagement of Ministry officials was a priority for them, and that the process could change the planning culture.

A Draft Bill was prepared and included as a primary instrument for planning local Integrated Development Plan (IDP). There is also allowance, where this capacity to do so, for Local Area Plans to assist in areas that are deemed to need special planning. Similarly, provision for Sectoral Plans through the IDP is included. Finally the nature and scope of the IDP are informed by National government through planning guidelines. Thus an integrated planning system across government is proposed. Of particular note too, is the provision for Regional Development Plans and Strategies which can be prepared when deemed necessary by the Minister.

The draft bill is not yet implemented and despite the challenges and delays associated with the project has raised constructive points to be addressed in future legislative reform projects, particularly in relation to the comprehensiveness of reform and assumptions on support for change and culture. What is reflected in the draft bill however, is an acknowledgment that there is a place for comprehensive planning which should be commensurate with the capacity for local authorities to implement.

Source: Berrisford, 2011.

#### 4.3 Detailed land use planning

Land use planning provides a policy mechanism that enables diverse and often conflicting objectives to be integrated and addressed in a development or spatial framework– this

process and its output, is referred to as 'integrated land use planning'. Through its development and implementation detailed land use planning:

- Identifies appropriate area(s)/location(s) for specific land uses;
- Determines what risks are associated with specific land uses in specific locations;
- Determines and identifies sensitive or important societal or environmental features; and
- Details minimum requirements/expectations of particular land use types.

Put simply, it determines what development is required and where it should go.

Urban land use plans should, ideally, form part of a suite of urban management tools and plans and may include water resource management plans, water catchment or river basin management plans, coastal management plans and surface water management plans. Such plans are likely to be the responsibility of different governmental departments or agencies and the urban use plan will be informed by these dedicated management tools.

Land use plans, on the other hand, will incorporate infrastructure planning and water management alongside other priorities, land availability and environmental hazards. Plans will need to balance the need for urban growth and development with the objectives of sustainable water management and infrastructure planning.

Detailed land use planning is rooted in rational planning principles. Its systematic approach, while at time criticised for being technocratic, allows planners, policy and decision makers to understand a particular context and develop a series of possible responses. This approach is particularly instructive for integrating land use planning and infrastructure planning

A broad methodological approach to detailed land use planning commences with a situation analysis and is followed by forecasting and problem identification. This provides the basis for the formulation of goals and analysis of alternative courses of action and moves on systematically to implement a selected course of action and monitor implementation towards achievement of set goals. (Conyers & Hill, 1984; Rakodi, 2001; Egbu, 2007 as cited in Awuah, 2010)

Contemporary planning practice encourages mixed use, responsive and adaptable urban spaces as the basis for land use planning. This is achieved through establishing policy principles at all tiers of planning. At a strategic level broad objectives are embedded translating to policy statements which then at the operational level are translated into development parameters.

Development parameters provide a more detailed framework for which development can occur. It provides the overall objective(s) for an area. For example, the objective for a mixed use zone or area may be to provide residential, community and some retail facilities including adequate provision of service infrastructure. This objective is then supported by guidance on minimum requirements or principles of development control.

A development framework is the instrument that integrates strategic objectives with operational or practical guidance. A development framework needs to outline the development objectives or vision for an area(s) at a strategic level or policy level, that is, it details what the desired objective or aim over a particular time period of an area. For example, an area identified to allow for future population expansion and development in the form of a residential area. Broad principles of development control or mechanisms for managing the urban environment should also be outlined. A comprehensive land use plan will balance the development objectives of an area/community with those also of the environment and long term sustainability.

A development framework needs to be reviewed and updated regularly. A common critique of land use plans is that they are static and non-responsive, particularly in the context of SSA where many of the land use plans are relics. Contemporary land use planning takes some steps to addressing this through the integration of infrastructure planning, hazard risk planning and community participation.

Developing development frameworks and parameters and the development detailed land use plans requires a range of data sources and questions to be asked. Such questions include:

1. What is the development objective?
2. What environmental assets are present?
3. What development constraints exist?
4. What and where is major infrastructure located/exist?
5. What type of development is appropriate in this area?
6. What opportunities exist to encourage multifunction or mixed use areas?
7. What types of changes are likely to occur over time e.g. pressure for urban land, informal development areas and climate change impacts?
8. What type of management controls are necessary? (based on preceding outcomes to questions above)

#### 4.4 Planning for resilience: reducing risk

As seen above, urbanization and urban population growth and expansion are tending to place settlement areas, in particular new ones, at risk, with the vulnerability of residents to disaster thus often increasing. Flood risk is a specific issue here, as is the pollution of water resources with its consequent negative public and environmental health impacts. The adverse effect of climate change and variability in increasing risk profile of African urban settlements at different scales is also highlighted. The ways in which urban risk management affect vulnerability to urban natural hazards in general and flood risk in particular is discussed.

The idea of ‘compact city’ discussed above has often been promoted as an urban planning framework that can contribute to sustainability. However, a closer examination of the problems shows that it is not urban density and sprawl that is the problem, but rather the lack of adequate land use planning measures and infrastructure provision in areas with a high concentration of people, such as informal settlements. Adequate land use planning and provision of urban infrastructure is a prerequisite for urban development. The focus should thus be on the ways in which risk aspects can be integrated in urban planning, forming a comprehensive response to hazards driven by urbanization and climate change.

It is vital to understand the interplay between land use planning, resilient planning and urban water management in order to ascertain the way in which current and future urban planning and implementation leads to, or has the potential to, decrease vulnerability and risk. And this process will promote and lead to integration of urban planning in the water sector.

##### 4.4.1 The need to reduce health and environmental risk

Health and environmental risks are severe, yet often not addressed in planning framework that fails to link health and the environment to key areas of water sector management, such as network coverage and scaling up initiatives. Even where water supply has received more attention, the significance of improved sanitation infrastructure, planning, services and practices is largely neglected, and there is limited if any involvement of communities and households in raising awareness and planning for development of sanitation services.

The impact of climate change and variability on water availability will probably be the most important one for the health of urban populations. Cities and towns in Sub-Saharan Africa often experience failures in supply due to extreme drought events. Climate changes are likely to cause a further decline in environmental water resource availability in urban areas, particularly where water resource management is poor or non-existent (Kovats and Akhtar 2008). It is important however to bear in mind the underlying political and socio-economic reasons for the lack of access to improved water for the urban poor.

To decrease environmental and urban health risk and vulnerability it is a prerequisite for the urban populations as well as for the policy- and decision-makers to be knowledgeable about the nature of the risks. Further focus should be given to public awareness. In addition, it is important to strengthen informational, technological, and scientific capacity within developing countries to better respond to health and environmental risks. As Costello et al.

(2009) point out lack of research capacity that can inform urban planning in poor countries is likely to deepen the social inequality in relation to health (Costello et al. 2009). Costello et al (2009) add that in Africa there has been no comprehensive assessment on the effect of climate change on health.

Better water management that incorporates a public health perspective provides opportunities to reduce health risks and at the same time reduce costs (Bartram 2008). An evaluation of the costs and benefits of water and sanitation for 17 WHO sub-regions and at the global level by Hutton and Haller (2004) found that for most developing countries the economic benefit for one USD invested in water and sanitation interventions could be between five and 11 USD.

#### 4.4.2 The need to reduce vulnerability to disasters and climate change

Reducing urban vulnerability requires the provision of adequate infrastructure and services, including adequate urban water management. Because of the very characteristics of cities and towns in SSA and elsewhere, urban planning plays a very important role in identifying appropriate land uses and adaptation responses that can increase urban resilience. It is nonetheless necessary policy- and decision-makers to show they are committed in reducing vulnerability to hazard risks. It also requires putting in place adequate institutional arrangements and allocating adequate financial resources.

The latest Global Assessment Report on DRR (GAR11) points out that often national disaster risk management functions lack the technical, financial and institutional capacity necessary to undertake effective action. There are however some good examples that worth looking at. Tanzania incentivized disaster risk management by locating responsibility for disaster risk management in its economic and financial planning ministry. In particular, the development of “Zanzibar Strategy for Growth and Reduction of Poverty 2010-2015 (MKUZA II) through the Ministry of Finance and Economic Affairs provided a strong push for disaster risk management, from reviewing and harmonizing laws and policies to infrastructure improvements and community-based disaster preparedness. Nigeria adopted a more ‘decentralized’ approach, where a central coordinating body chaired by the vice president leads policy development, monitoring and response, while at the lower levels of administration, states set up their own emergency management agencies with responsibility for disaster prevention, awareness raising, and local response preparedness (GAR 2011). The box below outlines Mozambique’s DRR strategy which embeds multiple functions from the local to the national level.

#### Case Study 9 Disaster Risk Management in Mozambique

Disaster risk mitigation efforts in Mozambique involve multiple initiatives, with the majority of these being non-structural measures. A Disaster Risk Reduction (DRR) strategy which incorporates climate change concerns has been in place since 2003. The National Institute of Disaster Management (INGC) is a government entity responsible for disaster prevention, response, and recovery. The institute is guided by a medium and long term ‘Master Plan for Prevention and Mitigation of Disasters’, which focuses on vulnerability reduction and strengthening the disaster preparedness of people living in areas highly exposed to natural hazards.

Awareness-raising tools were introduced to local communities, through schools and government organizations, aimed at enhancing people’s capacity to cope with disaster such as flooding. In addition, field-testing activities for the implemented measures take place through the training of Local Disaster Management Committees, as well as simulation exercises. Flood preparedness in particular, is facilitated by an early warning system, coordinated by the National Directorate of Water, together with the National Institute of Meteorology and the National Disaster Management Institute. The system provides forecasts of flood risk; detects and monitors flooding; and issues flood warnings when necessary, paving the way for a coordinated response.

Source: Adapted from Jha, Bloch and Lamond , 2012.

Climate change has been receiving more attention in policy initiatives, but this is still often at the initiative of global efforts and not drawn through to sector planning and practice. In the 2006 Human Development Report it is stated that (HDR 2006: 4):

Sub-Saharan Africa demonstrates both the complexity and the scale of the water security threat created by global climate change. Any evaluation of the threat posed by climate change for Sub-Saharan Africa has to start with the high level of pre-existing poverty and vulnerability. Almost half the region's population—some 300 million people—live on less than \$1 a day.

The overlap between measures for adaptation to climate change and disaster mitigation to address local problems, such as water and sanitation, solid and liquid waste disposal and drainage systems, needs to be considered (McGranahan et al. 2007). For example, an equitable solution of the land issues that drive people to locate in risk-prone locations could make a large difference to the urban poor.

Adaptation to climate change in Sub-Saharan Africa is thus vital. Sectoral adaptation measures will require strengthening of existing policies, emphasizing the importance of incorporating long-term climate change considerations into existing and future local development plans and policies (UNFCCC 2007). Adaptation to climate change in the water sector requires funding from the international community and national governments; multiple stakeholder participation at different levels, including vulnerable groups; robust but rapid economic, technical and institutional assessment as a basis for planning, standards and as a means of preparing for uncertainty.

Cities in Africa are well aware of the adverse effects of climate change and variability but most times action is not explicitly towards climate change adaptation, but rather towards improving the urban environment. For example, local authorities in Libreville in Gabon and Yaoundé in Cameroon have substantially increased budget allocations for improved urban environment. In Lagos, it is acknowledged that flood risk is exacerbated by poorly engineered and waste-clogged drainage systems. Although the local government in Lagos has undertaken action to improve service and infrastructure provision, climate change innervations are not high on the policy agenda as there is reluctance to provide basic public services in informal settlements, which are the most vulnerable to climate change, since they are regarded as falling outside of municipal jurisdiction (UN-HABITAT 2010).

At the regional level, in 2009, African Ministers of Environment from various African countries endorsed the 'Nairobi Declaration' and committed to enhance integration of disaster risk management and climate change adaptation interventions into their development and sectoral planning (UN-HABITAT 2010; UNEP/AMCEN/12/9, annex II). However, implementation of such interventions requires an appropriate and practicable framework for integrating climate change adaptation programs into wider urban development plans and policies. This is an area that needs to be further explored.

Although there is a need to adapt water supply and drainage systems to the adverse impacts of climate change (Huq et al. 2007), Muller (2007) points out that there are difficulties in doing this because of the future uncertainties and the difficulties of incorporating uncertainty into water infrastructure investment planning. For example, uncertainty about changing flood risk can lead to over-design, which imposes unnecessary costs, or under-design, which has serious implications for risk reduction.

Mukheibir and Ziervogel (2007) developed the Municipal Adaptation Plan (MAP), a guide for adaptation at the local level. Taking into consideration that this paper focuses on urban water management the following 10 steps from Mukheibir and Ziervogel (2007) have been adjusted for the purpose of this assignment:

1. Assess current climate trends and future projections to identify urban water infrastructure and urban settlements that may be affected by climate change

2. Carry out climate vulnerability assessment of urban areas to identify current and future sectoral and cross-sectoral vulnerabilities based on current climate variability risks and future projected climate scenarios (e.g. in the water sector)
3. Review current development plans and priorities (e.g. strategic plans)
4. Identify 'hotspots' where adaptation activities should be focused.
5. Develop adaptation options that integrate climate-sensitive responses within wider urban development priorities and focus on areas that are particularly vulnerable to climate changes
6. Prioritize the adaptation options using tools that can identify financial implications of an intervention, such as multi-criteria analysis (MCA) or cost-benefit analysis (CBA)
7. Develop the necessary documentation including program and project scope, design documents and budgets
8. Implement the prioritized interventions
9. Monitoring and evaluation of the interventions on an on-going basis
10. Regularly review and modify plans as necessary.

#### 4.5 Incorporating infrastructure, resilience planning and health considerations

Contemporary urban planning practice requires consideration of numerous and often conflicting objectives. The need to accommodate rapidly growing populations, provide adequate infrastructure, the appropriate land for commercial and industrial development, open space, adequate protection of the environment, all of which are in a constant state of flux and change, is hugely challenging. The level of complexity continues to evolve as the rate of urbanization increases and consideration to natural disasters and climate change becomes more pronounced.

Although rational comprehensive planning has been strongly criticized in SSA for its top down approach and the production of static and non-responsive plans, there is a growing argument and indeed need for urban planning activities and for the involvement of government to increase (Parnell and Simon, 2010). Indeed, the failure to modernize the planning system, or replace its planning instruments and techniques with tools that are better suited to the realities of a rapidly urbanizing and expanding urban Africa, notably at the strategic level, has left something of a vacuum, which serves to frustrate the integration of plan making and implementation.

The preceding sections outlined the relationship between legislation, strategic planning, detailed land use planning and planning for resilience. Each stage requires consideration to issues that are cross-cutting and are thematically similar but framed within different contexts. For example, at a legislative level objectives need to be outlined, definitions provided, roles and responsibilities articulated and operational aspects (through regulations) addressed. The function of strategic planning is then, within the legislative framework set, to articulate the vision of a particular sector supported by specific policy objectives. This policy framework is then translated into operational plans at varying degrees of detail. The integration of infrastructure planning, including water, land use planning and planning for resilience needs to occur at the legislative, policy and detailed levels.

## 5 Institutions, Accountability and Water Management

Urbanization and climate change in Sub-Saharan African cities means they are now facing major challenges of resource sustainability, water security and water supply. In these changing contexts, rigid urban planning approaches – separate from sector investment planning – are inadequate for coping with these challenges in cities at large, and especially in fast growing and largely unplanned expanding areas. Nonetheless, while rigid urban planning approaches associated with unmodernized planning systems do not meet the needs to the modern African city, comprehensive planning should not be overlooked as an effective mechanism to assist cities meet the demands of their residents.

This section articulates key issues and draws on practical examples to demonstrate how effective and accountable institutions can help ensure legitimacy, strategic focus and sustainability of integrated urban and water sector planning.

### 5.1 Understanding urban water management: resources and supply

The sustainability challenges to the water sector in SSA are visible in the mounting cost of water shortages, water treatment, the renewal of existing sources (like wells), and the development of new sources. To understand how these issues relate to the management of water resources and supply for urban areas, it is necessary to hone in on a few key management dimensions.

**Institutionally**, in most countries, the political responsibility for water resource management (WRM) is mostly placed with national governments, while more local institutions or dedicated national supply companies are tasked with Water Supply and Sanitation Services (WSS). For example, South Africa – generally regarded as a leader on water sector policy in SSA – has overhauled its water management system since the mid 1990s with reforms that cut across the sector, including cities. It places considerable emphasis on the role of local stakeholders and local governments, as well as other decentralized structures. A National Water Act is the primary legal instrument for implementing the national water policy. It recognizes that "water is a natural resource that belongs to all people" and provides an overall framework for key decisions in the sector. It places water resources under control of the National Government, but it allows for statutory and non-statutory institutions in designated Water Management Areas to deal with key issues, as well as for the formation of stakeholder participatory institutions. The Water Service Act and a set of local government legislation place water and sanitation services within the jurisdiction of municipalities, and enable several institutions that interface with residential users or industrial users. Finally, the Disaster Management Act deals with the management of disasters such as floods and droughts, including the framework for coordination across national ministries and between different levels of government. The separation of such responsibilities is not uncommon in SSA countries for example, in Ghana, the Ministry of Water Resources, Works and Housing is responsible for setting water policies for the country, while the Ministry of Local Government and Rural Development sets policies and programmes for the efficient administration of local government structures and the Ministry of Finance and Economic Planning provides the finance to support the delivery of urban water and wastewater infrastructure as well as the operational and capital expenditure budgets of the sector institutions. In comparison, the Department of Town and Country Planning, now upgraded to an agency, was shifted from one ministry (five in total) to another over a 15 year period.

While this distinction between national resource management and more regional and local service delivery has brought a necessary level of specialization, in most SSA countries it has had the effect of planning for WSM and water supply not been particularly well coordinated, and roles and responsibilities in practice actually not well defined either. In water scarce and financially stressed African cities the ramifications of this lack of coordination and conflation of roles have been a lack of strategy, pragmatism and accountability. Steeped an assumption of abundance in the previously restricted growth urban environments of the colonial era, the planning, construction and management of centralised city water supply

schemes were believed sufficient to secure water availability, managed by the public sector at relatively low cost. In the formal urban environments of the colonial times this adequately served the requirements of urban elite, and to some extent the poorer communities.

In modern African cities, however, as seen above informal settlements have grown immensely and urbanization has become a continuous force, with large numbers if not the majority of people outside the formal planned urban system. Water supply systems and the institutions that manage them face significant challenges to adapt to the greater fluidity and pragmatism this requires. In today's African city the centralised systems do not reach substantial parts of the urban populations who live in growing peri-urban settlements. The rigid master plan-driven systems depicted in earlier sections of this document, not only fail the dynamic land use and spatial organisation of peri-urban areas and decaying inner cities, but have generally also lacked effective links to sector planning. The Integrated Water Resource Management (IWRM) paradigm has provided some pointers to the broader more integrated approaches required in this dynamic environment., as it takes into account the whole water cycle in the communities – water supply, wastewater, solid waste collection, treatment and reuse, as well as involving a stakeholders not only in cities but also in associated rural areas (Bahri, 2010).

The impact of IWRM in urban context is however not universal or autonomic. The context varies immensely between African cities and the institutional legacy within cities and in their intergovernmental relations with other levels of government is often not geared to the demands of IWRM in the urban context. To facilitate its impact, still requires that broader policy frameworks are in place to lay down key principles and support and embed resource allocations; that institutions are accountable and clear about their roles; and that the criteria for priorities are clear.

**Financially**, most African city governments or water companies are not fiscally strong or self-sufficient, and for many the transfers they receive from higher tiers of government are neither sufficiently predictable nor adequate to compensate for the local inadequacies. The result has been underinvestment, but in the absence of clear incentives to render responsive services, revenue management to enhance local or utility financial sustainability has also been weak. In the culture of the 'water supply' city that Browne depicts for Australia, the assumption of an abundance of water through centralised systems and provided by centralised institutions, the pricing of water has remained low and mostly users have been charged for water use as part of a flat property rate that also included most services, or a flat rate for water charges. In Browne's words, the 'hydro-social contract implicitly promised the delivery of ... cheap and largely limitless... water from a benign environment' (2007).

**Operationally**, city governments and/or urban service providers have yet to expand water supply of water and maintain quality to meet the ever increasing needs of industry and to support growing populations. In water scarce African countries, the first challenge in both urban and rural areas often is unreliable access to water, and the second – which is more pronounced in the growing urban areas – is pollution of water sources and groundwater. Both have dramatic impacts on public health, the environment and the cost of water treatment and use.

**Multi-dimensional responses are necessary.** In part, the challenge entails improved water management policies that keep track with economic development and growing and expanding human settlements, and that are able to strike a balance between the protection of sources and the management of water to meet the growing demands. Policies, however, are not sufficient by themselves. African local government and water sector managers must be provided with the tools and capacities with which to make the policies work (Butterworth, et al, date?). This will require the development of appropriate legislative, planning, implementing and management tools as well as the introduction of mechanisms to generate and manage increased revenue for water resource development activities. In part this is an issue of better professional skills and available financial resources to address critical areas such as integrated water resource planning and management and operation and maintenance of water related infrastructures and services. Cities need strategic investment to meet access

targets and long-term sustainable outcomes. For the water sector, such a strategic approach requires linking water management and planning – both of water resources and of water supply – to broader urban planning, management and financing.

To become sustainable, it is important to shape the institutional rules and relationships, and systemic incentives to ensure that such water challenges get addressed more pro-actively, efficiently and in sync with the wider urban growth and development strategies discussed above. Key focus areas for such incentives hinge upon (Baietti et al 2006):

- **External autonomy**, which would protect the technical bodies (boards, utility or functional water departments) from external interference so that managers are clearly accountable for important decision making that affect results, e.g. setting tariffs, debt management, hiring staff.
- **External accountability** in utility's relationships with (a) *policy makers* who guide the management of the utility and service delivery priorities and quality (b) *owners* who set performance targets and financial objectives (c) *regulators* who monitor compliance with legal and contractual obligations and service standards, determine tariff levels, and mediate conflict between providers and customers; (d) customers to *demand* quality service; (e) *financiers* that provide debt and equity to facilitate investment. These relationships provide incentives for process results: performance standards set; use of external auditors; effective financing; external groups represented in advisory or oversight bodies; independence of the regulator etc. (ibid)
- **Internal accountability** to drive effectiveness and cost effectiveness, such as through responsiveness of the chief executive to the board; performance targets well defined and targeted to provide incentives and sanctions; regular staff performance evaluations, linked to incentives and performance targets etc.
- **Commercial practice** in the use of resources and management of process, such as outsourcing non-core functions like information technology services and engineering design and project management; specialized maintenance of buildings and equipment; services such as reading meters, billing, and collection, etc.
- **Customer focus** heightens the utility being sensitive and responsive to clients' needs, which may be visible in billing and collection system, surveys, information sharing etc.

**Integrated urban water management (IUWM)** provides a useful – albeit not perfect – tool to plan for and structure interventions and incentives over the entire urban water cycle; the relationships among water resources, energy, and land use in an urbanizing world; the connections between managing freshwater, wastewater, and storm water within a broader resource management structure; water uses and reuse options; developing innovative approaches for technology, finance and social inclusion; and the balance between specialisation and integration of institutions to approach these questions with the city as unit of management (Vairavamoorthy, 2011). The case study on Cape Town and Polokwane in South Africa below provides an example of how cities have responded to the challenges of water security. It has to be added that IWRM has not as yet had unqualified success in African cities, and its prospects of doing so hinge upon much further progress to develop practical roadmaps to implementation, addressing the functioning and accountability of institutions, and robust criteria to evaluate success and prioritize funding and investment (Srinivasan et al, 2011).

**Planning and coordination is required for optimal use of resources**, and is a pertinent point for water resource management and utility supply to intersect. A complete wastewater discharge, treatment and reuse system requires an integrated view and adapted legislation and institutional structures, as well as interagency coordination, control and regulation to ensure standards and procedures for water reuse, such as monitoring and data collection. There is considerable scope for reusing wastewater for a variety of purposes, to the potential benefit of sustainable development practices. But African cities have generally lacked the coordination required for integrated urban water management to ensure effective storage and allocation of effluent for reuse, achieve effective cost recovery.

**Demand management** is especially important from the utility perspective – to achieve equity, urban water sector investments and service delivery have to give priority to the satisfaction of basic needs. This requires that existing facilities be utilised and maintained to the optimum, so that water losses are minimised and available supply capacities are fully used. Water demand management techniques include water saving, plumbing fixtures, flow control devices, educational programmes and progressive tariffs based on the marginal cost of water. It is technically possible to get more water and better sanitation to the urban poor, but to introduce these measures requires systematic management, based on sound data and astute awareness. It also makes sense to engage communities to become more engaged in setting priorities and in conservation, hygiene awareness and proper use of facilities. Where this is initiated at the outset in the urban planning process, more sustainable ownership becomes more feasible.

### Case Study 10 A tale of two cities: water resource management in Cape Town and Polokwane, South Africa

In South Africa's decentralized water sector framework, cities and towns are expected to ensure water security within a national policy framework. Two very different cities have achieved results in different ways, but with common messages of pro-active assessment, stakeholder engagement, and a good deal of context specific application.

**The metropolitan council of Cape Town** has laid the groundwork for a master plan to explore viable water supply alternatives with neighbouring municipalities, business and the agricultural sector within the Western Cape Water System (WCWS), a system of dams and pipelines owned and operated by the City and the Department of Water Affairs and Forestry (DWAF). The city council considered the potential impact of climate change in its strategic water resource planning because Cape Town is a growing city, with a burgeoning economy and population. A long term Water Conservation and Demand Management (WC&DM) strategy has helped reduce water demand significantly to less than 30 percent and led to pressure reduction in the reticulation system, leakage management, pipe replacement, wastage reduction by consumers through education and awareness programmes and substituting the use of potable water for sports field and garden irrigation with treated effluent; re-use of water for industrial use and irrigation and reuse of water for potable purposes. Due to the potential environmental impacts of large scale groundwater abstraction, the City has decided on an environmental impact assessment, with the long term in mind but an immediate focus on this decade until 2019.

**Polokwane**, the capital of Limpopo province in South Africa, was awarded 'Blue Drop' status by the National Department of Water Affairs (DWAF) because of its recent achievements in water resource management and the management of water supplies. Blue Drop Certification is an incentive-based regulation introduced by DWAF in 2008 to encourage excellent management of drinking water quality. Polokwane's reward is significant, considering the city's dry climate which requires that it imports water as well as the impact of urbanization which has seen high population growth and the growing demands of a growing local economy, where the city is the major economic centre. Sources are tenuous, as natural inflows from rivers and water bodies in the region are low and the constructed dams in the area were not planned for the emerging demand. Indications are also that that global warming will cause higher temperatures. In DWAF review in 2010, the Polokwane Municipality's Water Safety Plan was praised, also for being supported by safety plans in catchment areas, treatment plants and the distribution system, and detailed attention to demand management with systematic steps to contain water losses and leakage and improving technologies for reuse of water. As part of the strategy over the past few years, there has been an emphasis on building capacity to strengthen coordination of water use and supply; on a drought management plan including increased use of recycled waste water; conscious demand management by expanding water metering and volumetric monitoring programs, including the introduction of prepaid metering as well as a pressure reduction system to reduce water leakage; and price

structure in which water price rate increases with increasing water usage, thus rewarding lower usage while also ensuring basic access for poorer households.

Challenges remain substantial, but the combination of national incentives and technical support, as well as concerted efforts to link water resource management and water supply have made considerable progress possible.

Sources: South African Cities Network, 2011; Cullis et al., 2010.

## 5.2 Local level planning, institutions and financing in intergovernmental context

The evolution of water sector institutions in Sub-Saharan Africa has varied between countries, and between Francophone and Anglophone countries. We will not go into either country and city-based differences or the Francophone/ Anglophone dichotomy, but a few general observations may be useful.

### **Levels of decentralization of water sector institutions have varied.**

Decentralization has been less prevalent in Francophone countries, where the trend has been towards single national water utilities or entities. For example, in Burkina Faso and Senegal respectively, the National Office of Water and Sanitation (ONEA) and the Société Nationale des Eaux du Sénégal (SONES) have developed reputations as among the most effective service agencies in the continent, serving the especially larger urban centres. In Anglophone Africa, water has typically been more decentralised to local jurisdictions, mostly as water departments in municipalities or district governments, and since reforms in the 1990s through the formation of commercially oriented utilities. In some cases – such as the well-known Uganda National Water and Sewerage Company (NWSC) – the corporatization has brought the formation of separate national water service provider companies. Although international agencies like the World Bank have argued strongly for private sector investment and management in the sector, the greater trend has been towards public sector corporatization, with a limited degree of contracting out some functions. A World Bank/WSP study in 2008 found only 10 percent of countries achieved private sector investment in the sector (Banerjee et al, 2008).

### **Case Study 11 Senegal Urban Water Success Story**

Senegal's urban water subsector is a lead performer in Sub-Saharan Africa. The 2007-10 Poverty Reduction Strategy sets the national target for urban water supply access at 100 percent, by 2015, and the current rate is already 98 percent, according to the African Council of Ministers of Water (AMCOW). The Senegalese government has also set targets that are more ambitious than the MDGs by undertaking to connect 88 percent of households to the network in Dakar and 79 percent to networks in other urban centres by 2015. (AMCOW, 2011; Banerjee et al, 2008)

Senegal's success in urban water supply is mostly attributed to specialised, ring-fenced and professional service providers, as well as strategic use of the private sector. Urban water services have been delegated to a public company Société Nationale des Eaux du Sénégal (SONES) which is responsible for the management of water infrastructure assets and investment in the large urban centers and a number of villages. SONES has opted for a delegated Public-Private Partnership arrangement on a lease, contracting Sénégalaise des Eaux (SDE) to operate public water services in the larger urban centres, including the capital, Dakar. The Public Utility – the Office National de l'Assainissement du Sénégal (ONAS) – is responsible for investing in and operating wastewater and rainwater treatment facilities, and is on a performance contract with the National Sanitation Directorate. A national coordination unit coordinates different implementation agencies to align finance and monitors access to water and sanitation, as well as the operational, administrative and financial performance of the service providers.

Planning for infrastructure at local level is under the auspices of local authorities—urban

communes – that also act as contracting authorities for small and medium scale water and sanitation projects, in collaboration with central and regional state technical departments. The construction of larger scale facilities like treatment plants) are not decentralized, however.

Investment planning at local authority level is supposedly done through Local Water and Sanitation Plans (PLHA), a standardized method for communities to do an inventory and review of infrastructure, and planned to become instruments for participatory sector planning and budgeting. The local planning processes are also not incorporated into national budget planning, which makes the allocation of national budget resources for service to the poor a top-down process. Source: OMVS, 2009.

In Anglophone countries like South Africa, Uganda, Nigeria, Tanzania and Kenya there have been more overt drives for decentralization, with municipalities or city based utilities typically responsible for water supply services.

South Africa has had perhaps the most comprehensive decentralization in SSA with implications for the water sector. The 1996 Constitution allocated the responsibility for water supply and sanitation to local government and water supply and sanitation assets previously owned by national government were transferred to municipalities. Local government were also restructured after a comprehensive policy reform in term of a Local Government White Paper in 1998. Intergovernmental reform in turn redefined the role of the national government to that of policy maker, supported by a two-channel municipal grant system – a conditional capital grant for infrastructure investment and an unconditional operating grant that seeks to achieve greater equity in municipal services between better off and poor households.

A key lesson from this experience has been that it takes time – since the decentralization path was embarked upon in 1996, it took seven years to establish functional and well-defined decentralized arrangements. Alongside devolution to local government, South Africa also regionalized aspects of the water sector. Large or regional bulk water supply schemes are mostly under control of national government owned Water Boards. Local government legislation allows municipalities to cooperate in order to manage water services regionally where this economies of scale justify that, for example on joint wastewater management in the metropolitan area east of Johannesburg under a company called ERWAT (East Rand Water), and in province of KwaZulu-Natal where uThukela Water has aggregated water services under a cooperative agreement between several municipalities. Some municipalities have been reluctant to give up their autonomy, and the latter arrangement has not worked effectively.

### **Different regulatory approaches have been adopted**

Several Francophone countries have developed quite advanced regulatory frameworks without having recourse to an agency, and ‘delegated management’ through contracts. Lately, regulators have been formed in several Anglophone countries, but most regulators still face challenges of gaining stature and institutional power supported by clearly defined roles and powers in what historically have been fragmented and duplicating institutional frameworks. They also still need to progress in attracting enough competent staff, and developing mechanisms and reliable data to ensure the transparency of regulatory decisions. Mostly, regulatory agencies have not yet achieved a high degree of autonomy.

In the case of Senegal – referred to above – the post 1995 have also involved SONES engaging a private operator. The contractual framework included a concession contract and a sector development contract between the government and SONES, and a contract with the private operator which provided financial incentives for the private operator to achieve ambitious performance targets for leakage reductions and improvements in billing and collection efficiency. The regulatory framework was built into the contract, and SONES’ monitoring capacity strengthened to enforce it.

By contrast, in Kenya, a Water Sector Regulatory Board (WASREB) has been established, which is supposed to review pricing, quality and mediate conflicts. The implementation of these institutional arrangements have resulted in better information on sector performance through the annual WASREB Impact Reports, with data and reporting improvements each year. This has helped improve sector performance, as shown in the Impact Reports and has facilitated more investment in the sector as a result of better performing institutions. There is recognition however that WASREB needs to be given more authority, as this has been ambiguous given the role of regional water services boards that are neither regulators in the true sense of the word nor operators, but have implied roles in both. The regional water boards have not rigorously enforced license conditions. There have been debates therefore about empowering WASREB for regulating asset planning and creation, and directly licensing Water Services Providers, rather than leave this role with regional Water Services Boards.

### **Citizen involvement in regulation**

The involvement of citizens in regulation has been an emerging issue globally and has been attempted in a few cases in Africa. Citizen report cards (CRCs) have been used in the vast informal areas of Nairobi, Mombasa, and Kisumu, informing national policy priorities and operational focus areas for water service providers at local level. Guided by the Ministry of Water and Irrigation, the CRC initiative included civil society organizations and resident representatives. Qualitative focus group discussions and quantitative surveys made it possible to assess access and customer satisfaction. The CRCs highlighted important barriers to the poor, the significance of women in water and sanitation practices in households, consumer attitudes towards sanitation, and showed that consumers prefer face-to-face interaction with water company staff. In South Africa, the “Raising the Citizen’s Voice in the Regulation of Services” initiative has set out to enhance “bottom up” water services regulation, which entails informing citizens of their rights and of key issues, as well as institutionalizing monthly meetings between communities and their municipality on service delivery issues.

**The regulation and role of non-state water service actors** has become a more prevalent issue as the limitations of utility networks in low-income areas has become evident. This has been relevant both to large scale formal Public-Private Partnerships as well as in the use of small scale providers that reach where conventional utility water supply and sanitation services are not provided.

**The most high profile formal involvement of the private sector** through management contracts or larger contracts that have assigned the actual execution of the service in part or in total to private contractors. In Sub-Saharan Africa large scale concessions have been rare, mostly confined to parts of towns and cities in South Africa (Nelspruit and Dolphin Coast are the best examples). Perhaps the best known comprehensive management contracts have been used in Johannesburg and Dakar, but there have been numerous smaller scale contracts. In both cases, the sector planning has been located in broader urban planning frameworks – in the case of Johannesburg as part of a far-reaching strategic planning and restructuring of city governance after a fiscal crisis in the late 1990s. Regulation in the South African cases has occurred at a macro level through the national Department of Water Affairs and Forestry (DWAF), and in the case of Johannesburg through a specialized Contract Unit within the municipality, ring-fenced from the policy makers and the service provider, and skilled and empowered to monitor standards and guide pricing.

**The more unconventional engagement of non-state providers** has been about involving smaller scale providers, especially in informal areas. It has been controversial because water vendors have become associated in several cases – such as in Nairobi – with developing monopolies or colluding to raise the price of water. Conflict between such providers has also been a problem in some settlements. However, in unserved informal areas, they have often filled gaps that formal providers have been unable to address. For example:

- In Ouagadougou, Burkina Faso and in different urban complexes Senegal, growing networks of standpipes in peri-urban areas and unplanned settlements have been growing

since the late 1990s. The operators of these standpipes have been contracted by the national agencies responsible for water and sanitation (ONEA and SONES respectively) to help it extend water services to areas it finds difficult or not cost effective to reach through the main networks.

- In 13 peri-urban areas of Lusaka, Zambia, community-based water trusts serve around 600,000 people (WSP, 2009). Set up with the assistance of the international NGO, CARE and the Lusaka City Council and Lusaka Water and Sewerage Company (LWSC), the water trusts informally operate under LWSC's license. The city council is a signatory to the trust accounts and is involved in the appointment of board members who provide policy direction and develop service strategies. Each water trust has a scheme manager who manages staff such as water vendors/tap attendants, plumbers, and cashiers in terms of a contract for the operation and maintenance of a water point. Residents are able to buy water on a daily cash or monthly prepayment basis, and in some schemes there are household connections. Tariffs and connection charges are regulated by the National Water and Sewerage Commission which is also supposed to regulate service quality, albeit informally so.
- In Dar es Salaam, Tanzania, where piped water is not yet widely available, large numbers of water kiosks sell water to residents, and are doing so on the basis of an agreement with the utility DAWASCO. While providing a return to the operators, they have consolidated water points in a network with the official provider, and mean that they do not have to purchase their supplies from more expensive independent vendors. The kiosk initiative is also credited for having created jobs.

One of the challenges is to formalise the arrangements for these providers, for example drawing them into regulatory frameworks. This has not been smooth sailing, but there has been progress in various cities, such as Lusaka, Nairobi and Maputo, to include them in the regulatory domain. If such formalization of the informal providers is to accelerate, recognizing them in urban planning is a key step as cities plan for services in line with demographic and spatial evolution. The absence of data is even more pronounced in this case than with utility systems, and remains a major challenge. Treating resellers and vendors as integral to the water, drainage, sewerage and sanitary system may facilitate more inclusive policies that better serve poor end-users. For this reason forums for involving small providers in urban and sector planning and in the development of services may be vital instruments for improving relations between vendors, consumers and water utilities (Banerjee et al, 2008).

### **Performance incentives**

Incentives can be provided at utility level and in the wider intergovernmental system. At utility level, the autonomous state company in Uganda, the National Water and Sewerage Corporation (NWSC), for example, set standards for sewerage services in the larger towns and cities. In 1998, it started to introduce performance incentive programs and a client-oriented culture with a strong emphasis on service quality, which has led to greater financial sustainability, including debt management, and the performance contract specified the actions that the NWSC must take and the targets it was expected to meet. A Performance Contract Review Committee was established to monitor and report on the NWSC's performance in key areas such as updating the asset registers, introducing incentive contracts with its area managers, outsourcing noncore activities, and quantitative targets for collection efficiency, connections and metering, and operating costs. Since 2006, the performance contracts have placed particular emphasis on extension of services to the urban poor.

Intergovernmental transfers are important incentive tools, and have been used to a great extent in South Africa especially to support capacity enhancement in areas of weakness or fund services to particular customers, such as the poor. The equitable share in South Africa provides the base funding to assist municipalities extending services to the poor, while conditional grants for infrastructure and capacity building have aimed to reward performance and required systematic planning and institutional reform before disbursing funds, as may be associated with benchmarking or reforms. In most countries though, fiscal transfers have not

yet been used to full effect as their size, timing and even actual payment have not been predictable or known sufficiently ahead of schedule so that recipient institutions could budget for them as revenue; performance criteria have often not been clear or measurable; and the guiding policy frameworks for transfers have not always been particularly robust. We take these issues around transfers further in the next sub-section on Sector Finance.

### **Sector finance**

Public finance is the greatest contributor to investment in the water sector in African countries, and in overall terms it receives the second highest levels of public investment, after roads and transport. However, public finance support still falls short of most expectations and has not been able to address either the water resource or water and sanitation services dimensions of the water sector.

In the case of water resource management, no SSA country – except South Africa – as yet has in place a widely agreed and explicit policy framework for financing WRM. SSA countries therefore tend to lack coherent principles of water financing, which prevents clear financing choices around, for example, the roles of public and private financing; the mechanisms for making financing decisions; the roles and cooperation among different levels of government, and the overall budget trade-offs between WRM and other sectors. The implications for sector planning are severe as it depends on longer term goals, mutually supportive and coordinating agency roles and functions, and tying projects into longer term strategies and priorities (Briscoe, 2011).

As far as water supply and sanitation services are concerned, budget execution is only 75 percent on average, and much lower in many countries. The lack of effective medium-term frameworks means that actual resource allocations often do not match sector objectives, with activities running behind schedule, maintenance needs not accurately incorporated into medium-term sector planning tools to prevent asset rehabilitation, and administrative processes delaying the release of budgeted funds also needing to be overhauled. Transfers between the levels of government are often unpredictable and fragmented as they are sourced by different national ministries that are not aligned. Service providers are therefore never certain of the amount of money they will receive, and when they will receive it. Moreover, project-based, fragmented approaches to infrastructure create an incentive to propose new projects, rather than to introduce effective systems of asset management as part of an overall service delivery strategy. This does not encourage long range planning for service delivery (Foster, 2008).

In several countries – such as Kenya and Tanzania – international donors have supported dedicated water funds. Although such funds have helped overcome some of the fragmentation problems, they have meant that the consolidated efforts have not necessarily been incorporated into core state systems.

The weakness of performance incentives also crowds out private capital from public infrastructure investment as service providers prioritize lobbying national governments for particular infrastructure projects, rather than managing the overall sustainability of the service delivery system. The emphasis on capital spending encourages augmentation of capacity, rather than better management of existing assets. Service providers simply lack the incentives (a) to seek private capital and (b) to recover the cost of providing services from users, as grant financing or concessional loans have meant relatively cheap funding for asset creation or replacement. This makes water service providers less interested in private financing and has weakened the robust governance demands that would have made them more attractive to the capital markets.

A 2011 Public-Private Infrastructure Advisory Facility (PPIAF) report on Africa's Water and Sanitation Infrastructure (Banerjee and Morella, 2011) therefore calls for technical assistance to the sector to support government agencies' project identification and appraisal, prioritizing and planning, and not only for improving management practices of utilities. Assisting countries to manage their investments and projects better and more targeted as

maintenance and rehabilitation is identified as perhaps more vital than new investment. This concurs with the findings of the 2011 AMCOW Country Status Overviews.

In sector planning, there are at least four approaches to consider in improving the financial position for service providers, including their access to financing sources:

- **Public finance and intergovernmental transfers:** Given the considerable weight of transfers and national public financial support to the water sector, a more systematic set of grants is needed in most Sub-Saharan African countries. This could create incentives and predictable systems that promote key policy objectives and sustainable asset management, ensure access for poor households, encourage sustainable investment in urban infrastructure, and leverage private sector funding and improved asset and financial management. There are lessons in the continent on this: in South Africa and Senegal, for example, transfers have been linked to local development plans that set out local goals and sector priorities, involving local stakeholders. This approach would need to be adapted in different contexts, but it does contain useful pointers to the approaches required to place water sector investment within strategic frameworks that optimise the potential roles of the public and private sectors.
- **Private financing:** Thus far, private financiers have been averse to investing in the water sector because of the political risks associated with tariff setting, and the poor governance, asset management and financial management track records of providers. If sector planning and the overall policy and fiscal frameworks could provide greater certainty and resolve on the part of the authorities to introduce reforms and public finance accountability, it would create a more favourable context for private investors. This will take time, and may require a series of relatively modest engagements, but it would be constructive if planning aims towards such greater engagement.
- **Service provider/municipal level cost recovery:** Because increasing tariffs is politically difficult and subject to consumer backlash, decision-makers often shy away from charging water at an economic rate. Yet, willingness to pay surveys in various parts of the world (including Kenya and Senegal) indicate that it is vital to find agreement for a tariff increase between key stakeholders alongside viable service improvements by investing in improved efficiency which make it more legitimate to raise the prospect of tariff increases. It is difficult to increase tariffs when service is poor. Practical steps to improve revenues streams typically would include verifying that customers are correctly categorized within the tariff structure, or that meter accuracy is routinely checked. This can be achieved without adjusting the tariff level, even while increasing revenue and ensuring faster collection, all of which translates into an improved cash flow to the utility.
- **Efficiency gains:** Although tariff designs and possible tariff increases are important, improving cost recovery could be achieved through more basic efficiency gains, for example improvements in operational efficiency through improving billing activities such as reading meters, issuing bills and bill collection to develop mechanisms for users to make their payments. Energy cost savings can also be significant, for example by optimizing pumping systems, improving motor efficiency, reducing leakage through pressure management, automating system controls, and developing the metering and monitoring protocols needed for effective operations and maintenance. Reducing non-revenue water (NRW) is another crucial step towards improving a provider's financial soundness, i.e. clamping down on illegal connections that contribute to NRW. The precondition is to give service providers the operational autonomy and accountability that would incentivize them addressing these issues.

### **Citizen and customer focus**

**The citizens' perspective is vital.** National policies, effective regulation of standards and pricing, city plans and municipal, utility or water agency investments for rolling out infrastructure are needed indeed, but the enabling conditions for residents to access services require a wider perspective. Demand-side barriers include factors such as not being able to connect without legal land tenure. A WSP document in 2009 (ibid) notes that in African

countries (for example Tanzania, Ethiopia, and Ghana) where tenure is traditional and security of tenure is not equated with a title deed, utilities have installed connections in unplanned settlements without documentation and no legal problems have developed.<sup>16</sup> When lack of legal documentation is an obstacle, another approach to get around it is to make a single bulk water or sewerage connection at the border of the settlement. This demonstrates that while legal reform is needed to enable the poor to gain secure tenure, in the meantime, innovative rules could extend services even where people do not have land tenure. Another barrier concerns procedures for public interaction with service providers. The poor often find it difficult to understand procedures, and simplified, client-friendly procedures for connection, billing, and collection could encourage people to connect legally.

### **Measures of progress and performance in the institutional context**

The fundamental institutional issues is accountability. This is achieved through a clear separation of the policy making, regulatory and implementation functions which makes it possible to ensure implementation in terms of a clear policy mandate and regulatory framework, and managed by entities autonomously able to perform their functions. These distinctions leave space for leadership, coordination and integration, planning across space and institutions, stakeholder engagement, and the pursuit of innovative approaches within clearly guided frameworks.

Tables 5.1 and 5.2 provides an outline of evaluative questions relevant to integrated management.

Table 5.1 Principles of integrated management: Evaluative questions

| <b>Principles</b>                                                                            | <b>Evaluative Questions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integration of resource sectors                                                              | <p>Is there a lead agency that coordinates land-water management activities, programs or policies?</p> <p>Are there guidelines or guiding principles for the achievement of integration?</p> <p>Is coordinated implementation of management policies, programs and goals achieved?</p> <p>Is implementation of management policies, programs, and goals monitored?</p> <p>Do implementing staff have adequate skills to implement integration?</p> <p>Do implementation staff have adequate commitment to integration?</p> <p>Are there financial resources available that help to facilitate integration?</p> <p>Are there support networks available that help to facilitate integration?</p> |
| Coordination of government, non-government and community management policies and activities. | <p>Does a clear framework of coordination for implementation of management policies and activities exist?</p> <p>Is coordination between government, non-government and community stakeholders occurring?</p> <p>Are stakeholders accountable for coordinated implementation of management policies and activities?</p>                                                                                                                                                                                                                                                                                                                                                                         |
| Stakeholder participation in resource management                                             | <p>Are there opportunities for stakeholder participation?</p> <p>Are stakeholders who should be involved in land-water management clearly identifies?</p> <p>Are the roles of stakeholders clearly defined?</p> <p>Is equity maintained throughout the management process?</p> <p>Do stakeholders have a strong role in the management process?</p>                                                                                                                                                                                                                                                                                                                                             |
| Accommodation and compromise                                                                 | <p>Is there awareness about the potential problem of rapid development and the long term availability of local water</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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resources?  
 Are policies, goals, objectives and means of managing development compatible with those of water management?  
 Are mechanisms are in place to resolve conflict over the use of water in the event of drought?

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*Source: Carter et al (2005), Closing the circle: linking land use planning and water management at the local level, Land Use Policy 22.*

**Table 5.2** Principles of sustainable management: evaluation questions

| <b>Principles</b>                                       | <b>Evaluative Questions</b>                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Long term objectives                                    | <p>Has the long term demand for and supply of water resources been assessed with consideration for the projected growth of the municipality?</p> <p>Do long term strategies for the balancing of development and water use within municipalities exist?</p> <p>Is variability in water supply, due to climate change and changes in use of water, considered?</p> |
| Wise and efficient use of water resources               | Are principles of wise use available?                                                                                                                                                                                                                                                                                                                             |
| Local solutions                                         | <p>Is the amount and availability of local water supply known?</p> <p>Do growth management strategies consider the availability of local water supplies?</p> <p>Is consideration of water availability a condition within the development approval process?</p>                                                                                                   |
| Prevention or reduction of natural resource degradation | <p>Do management decisions have consideration for the long term implications to aquatic habitats?</p> <p>Do management strategies help to protect groundwater recharge/discharge areas?</p>                                                                                                                                                                       |

*Carter et al (2005), Closing the circle: linking land use planning and water management at the local level, Land Use Policy 22.*

## 6 Conclusion: Integrating urban planning with urban water management

Section 3 provides an historical overview of planning regimes within SSA and is followed by a several examples of contemporary planning in SSA. With the major exception of South Africa, the prevailing African experience is that of a struggle to effect change within urban planning and associated planning regimes. In moving forward, it is clear that the static ‘blue print’ approach is neither feasible nor desirable. Further, the overall level of development planning in SSA is limited and despite a great deal of conceptual thought about risks (i.e., environmental, natural hazards and climate change and variability) and action in the policy domain, integration between government agencies is lacking or in many instances wholly absent. Within this landscape there are promising instances and as has been highlighted in the case studies throughout this paper, these have the potential to provide a good platform for cities and towns in SSA to develop integrated policies across urban planning and urban water management.

The principal challenge for SSA in the urban sphere is to address how its cities and towns respond to the massive challenges of rapid urbanization, urban expansion, the increased demand for services, constrained and failing urban planning systems and embedded institutional practices of ‘silo’ working? This paper advocates that urban planning is central to the development of cities that can cope with these pressures and that in order to achieve this, infrastructure planning, specifically for water, must be integrated within this process. This position is reflected also in UN-HABITAT’s *State of African Cities Report* (2011) which states:

Forward looking spatial planning decisions alone are not enough. In order to prevent any policy gaps, it is important to link national, regional and local environmental adaptation and mitigation policies through vertical and horizontal cooperation across all tiers of government as well as all relevant stakeholders.

A central message here is that strategic level urban plan making provides a practical opportunity for such integration and integration: what is urgently needed is an updated comprehensive plan format and techniques. Comprehensive planning methodologies continue to adapt and evolve in Europe, the US and parts of the Middle East and Asia – effort surely needs to put into making better progress on plan making practices in Africa.

In developing the links between urban planning and water management and integration we have built on the work of Carter et al (2005), whose useful tables were just excerpted, and the International Water Association Cities of the Future Program (2010). Two matrixes which aim to assist planners and decision makers first situate their town or city within a particular urban typology (Table 6.1); and from there through ten guiding principles to begin to develop appropriate policy and plans and also to benchmark their progress (Table 6.2). This process can thus also assist to understand a particular urban area’s trajectory towards integrated practices. We draw on Brown, Keath and Wong (2009) for the water regimes. The three regimes are those currently prevalent in SSA (the authors add three more, which are more future-oriented: the Waterways City, the Water Cycle City, and the Water Sensitive City). By analogy, planning regimes move from less to more complex and integrated: with the Minimally planned regime featuring no real land use plan of any kind; Partially Planned, local level detailed land use plans; and Fully planned, both strategic-level and detailed plans.

Table 6.1 Typology

| Current state of development | Large to megacity | Medium or intermediate cities | Small cities and towns |
|------------------------------|-------------------|-------------------------------|------------------------|
| Urbanization dynamic/ rate   | Low (0-3%)        | Medium (3-4%)                 | High (above 4%)        |

|                              |                   |                   |               |
|------------------------------|-------------------|-------------------|---------------|
| <b>Water regime</b>          | Water supply city | Sewered city      | Drained city  |
| <b>Water Security</b>        | Low               | Medium            | High          |
| <b>Urban Planning regime</b> | Minimally planned | Partially planned | Fully planned |

Source: The Authors

The concept of benchmarking can be useful to aid decision makers in assessing how well they are progressing with delivering integrated urban planning and water management. The following table sets out benchmarks in the development of better integration of urban planning and water manage, in alignment with the 10 underlying principles. It is designed primarily for a city-level planner or official, who can review the work that has been done in a particular urban area, identify from the table, broadly speaking, how far they have met the principles at that stage, and thereby establish what is required to advance towards a more integrated solution. The final three case studies that follow – of both a large and a small city in Southern Africa, and of how integration occurs in South Australia – offer illustration of the principles.

Table 6.2 Linking land use planning, planning for resilience and water management

| <b>Guiding principles</b>                                                                                      | <b>Benchmarks</b>                                                                                                                           |                                                                                                                          |                                                                                                            |                                                            |                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Understanding and accommodating growth must be reflected in the physical development and form of a city</b> | Urbanization rate: low urbanizing countries (0-3 %), medium urbanizing countries (3-4 %), and, high urbanizing countries (greater than 4 %) | Urban density (urban land cover) and possible density scenarios                                                          | Urban expansion that accommodates growth (i.e., plans that include areas for urban expansion)              | New centralities that arise as a result of urban expansion | Urban risks: environmental degradation and pollution, natural hazards and climate changes                                                          |
| <b>Cities must become priority areas for public policies</b>                                                   | Understand the causes, structure, workings and management of expanding zones and also how and where they now fit within the wider city      | Provision for particular urban areas to expand beyond their current boundaries to accommodate/alleviate growth pressures | Preparation of development plans and policies to deliver and facilitate changing and expanding urban areas | Provide the necessary services and service infrastructure  | Planning theory that places emphasis on the places, spaces and people within the local context and stakeholder engagement (collaborative planning) |

|                                                                                                                                  |                                                                                                                                                      |                                                                                                                                                                                                                   |                                                                                                                                                                         |                                                                                                                                               |                                                                                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Urban expansion, changing structure and form, and risk changes the role of planning</b>                                       | Analysis and assessment of existing conditions to develop an understanding of the drivers of urbanization and to determine what the future needs are | An assessment of the current level of servicing, and of economic and social development in a municipality                                                                                                         | Identify local priorities and objectives                                                                                                                                | Sectoral plans and legislation (e.g., water plans, transport plans, waste management plans, disaster management plans and housing strategies) | Set of key performance indicators and performance targets                                                                                     |
| <b>Contemporary planning practice requires strategic planning to be an integral element of the planning process</b>              | Identify long-term objectives                                                                                                                        | High level strategic plans that set a development framework and integrate considerations such as land supply, infrastructure requirements and location (hard and soft), open space and areas for future expansion | Legislative and policy instruments: consideration to respective sector(s) relationship such as planning with water, power and transport understood at the highest level | Operationalize action plans                                                                                                                   | Monitoring and evaluation of plans and regular reviewing and modifications as necessary                                                       |
| <b>Land use planning enables diverse and often conflicting objectives to be integrated in a development or spatial framework</b> | Identifies appropriate area(s)/location(s) for specific land uses                                                                                    | Determines what risks are associated with specific land uses in specific locations;                                                                                                                               | Determines and identifies sensitive or important societal or environmental features                                                                                     | Details minimum requirements/expectations of particular land use types                                                                        | Land use plans form part of a suite of urban management tools and may include water resource management plans, water catchment or river basin |

|                                                                                                                                                                  |                                                                                                        |                                                                                       |                                                                                             |                                                                                                                     |                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                  |                                                                                                        |                                                                                       |                                                                                             |                                                                                                                     | management plans, coastal management plans and surface water management plans                            |
| <b>Cities need to Integrate disaster risk management and climate change adaptation into wider urban development plans and policies</b>                           | Vulnerability assessment of to identify current and future sectoral and cross-sectoral vulnerabilities | Identify ‘hotspots’ where activities should be focused and prioritize accordingly     | Review current development plans and priorities (e.g. strategic plans)                      | Inclusion of disaster and climate change risk concerns into land use planning and other municipal laws and policies | Make sure that there is adequate institutional and resource capacity to implement the plans and policies |
| <b>Cross referencing or link up between different sectors is central to both strategic planning but also integrated planning</b>                                 | Legislative level because actors have to acknowledge actions                                           | Strategic level where objectives and principles with regard to different sectors      | Policy level (i.e., detailed sector plan)                                                   | Comprehensively planned for services urban areas                                                                    | Monitoring and evaluation to inform next round of strategic plans                                        |
| <b>Shape institutional rules and relationships , and systemic incentives to ensure that water challenges get addressed pro-actively, efficiently and in sync</b> | Set up planning regulations to require water objectives to be included in development from the outset. | Define roles of government, non-government and community in the provision of services | Develop integrated management plan that has objectives and outcomes across multiple sectors | Adopt integrated urban and water management processes                                                               | Monitoring and evaluation of plans and processes, and regular reviewing and modifications as necessary   |

|                                                                                                                                             |                                 |                                                                                             |                                                  |                            |                                                                  |
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| with wider urban development strategies                                                                                                     |                                 |                                                                                             |                                                  |                            |                                                                  |
| Integrated urban water management (IUWM) as a tool to plan for and structure interventions and incentives over the entire urban water cycle | Study of catchment area         | Identify barriers that restrict IUWM                                                        | Define strategic objectives                      | Adoption of the objectives | Financial rewards and mechanisms to achieve sustainable outcomes |
| Linking urban water management with urban planning can achieve sustainable outcomes                                                         | Integration of resource sectors | Coordination of government, non-government and community management policies and activities | Stakeholder participation in resource management | Long-term objectives       | Local solutions                                                  |

Source: The Authors

## Case Study 12 Implementing sectoral climate change adaptation in Durban, South Africa

Durban is the largest port in Africa, and with a population of around 3.5 million, the third largest city in South Africa. The local government structure responsible for planning and managing the city is the eThekweni Metropolitan Municipality. Since 2004, eThekweni Municipality has been working on the development and implementation of a Municipal Climate Protection Programme (MCP) which incorporates an assessment of the local impacts of climate change and the development of locally- focused response strategies required to address these impacts. In 2006, after the completion of the initial climate change impact analysis, the MCP was initiated with the development of a Headline Climate Change Adaptation Strategy (HCCAS).

The HCCAS identified key municipal sectors that would be impacted the most by climate change, and recommended appropriate and practicable adaptation options. The sectors that were of primary focus for the strategy included: health, water (i.e., water and sanitation, coastal policy, stormwater and catchment management), biodiversity, electricity and transport infrastructure, food security and agriculture, strategic planning, economic development and disaster management.

During the preparation of the HCCAS it became clear that there were significant differences in the institutional capacity of these sectors to respond to climate change. Although some sectors such as the water sector were already considering the co-benefits of climate change adaptation, most sectors demonstrated limited awareness or prioritization of climate change issues, such as the economic development sector, or the disaster management sector, where action was constrained by structural limitations. With regard to the latter, it emerged that despite the fact that climate change was acknowledged by disaster management experts as an important issue, the role and function of the Disaster Management Unit at that time did not help for this to materialize. Disaster risk management was regarded as ‘responsive’, rather than ‘proactive’ function, while the city’s Integrated Development Plan (IDP) did not even include any disaster risk management considerations.

In response to the limitations mentioned above, the HCCAS recommended that the disaster management function should prioritize proactive and strategic interventions. It was recognized that the city needed to plan the location of new developments in less vulnerable areas, ensure that key infrastructure and people are located away from flood-prone and landslide areas, increase the institutional capacity of the Disaster Management Unit, and last but not least, develop a local disaster management plan for inclusion in the IDP.

While the HCCAS process was successful in raising awareness about climate change impacts and possible responses, no new adaptation actions were initiated. For this reason it was decided that the best way forward was to embed adaptation planning through the development of sector-specific adaptation plans. The new strategy might be regarded as contrary to the emerging consensus that adaptation planning should be an integrated and cross-sectoral process, but it was the only practical way “by which to begin mainstreaming the process of adaptation planning in a municipal environment dominated by competing and often conflicting sectoral and political interests.”

Two pilot sectors (i.e., health and water) were initially selected to test this more focused approach. These two pilot sectors were selected because of their vulnerability to climate change and variability, their importance to the city’s development agenda, the fact that the city’s Environmental Planning and Climate Protection Department (EPCPD) had a good working relationship with key individuals within these sectors, and that these two sectors would be affected by similar climatic factors (e.g., the loss of wastewater treatment infrastructure during a storm would result in health impacts).

In the first meeting to review the progress on the implementation of the sectoral adaptation plans in 2010, ‘institutional functionality’ emerged as the most important determinant of success. Debra Roberts of the Environmental Management Department of eThekweni Municipality points out that: “despite the serious risks posed by climate change, it is very basic institutional and resource challenges that are currently delaying appropriate disaster management planning, and not factors such as lack of access to new technologies and more sophisticated data sets...This more sectoral approach encouraged greater interaction among the sectors and provided each with a clearer understanding of their needs and roles from an adaptation perspective.”

Sources: Roberts 2010 a, b; eThekweni Metropolitan Municipality

### Case Study 13 Walvis Bay, Namibia

Walvis Bay in Namibia has a population of approximately 60,000 and is located between the Namib Desert and the Atlantic Ocean on the west coast of Namibia. This coastal area is arid and receives very little rainfall – on average less than 10mm year. Within close proximity (approximately 30 km away) is the city of Swakopmund which has a population of approximately 42,000. Both these cities are experiencing urbanization pressures and environmental changes. This case study looks specifically at how a small city in SSA is addressing water management, urban planning and environmental management and moreover, how a collaborative approach between two cities on water management issues can be achieved.



Namibia Vision 2030 provides the strategic framework for development within Namibia at a national level and is administered by the National Planning Commission: regional and municipal level plans then follow, all of which informed by the Namibia Vision 2030 plan. Planning and Development in Walvis Bay is informed by a series of planning documents which include a structure plan and town planning scheme (or detailed development plan). Urban development is located only within zoned “townlands” and areas of environmental sensitivity are protected, including those adjacent to the city’s water supply. These documents are supported and complemented with a series of environmental and sector plans. This included the production of an environmental management plan as part of a Local Agenda 21 program between 2001 and 2005. A key principle included in this plan was the reduction of water demand to a manageable level.

Adequate water supply to residents and industry in Walvis Bay is a key concern for the Municipality as its population grows and the town expands. Plans to build a desalination plant in Swakopmund in an effort to reduce pressure on water supply for Walvis Bay are currently on hold for several reasons, the principal one being a reduction in water consumption in Walvis Bay. The reason for this reduction is two-fold. First, a re-structured tariff was introduced. The Walvis Bay Municipality doubled its tariffs between 1998 and 2003; prices also rose in later years. This contributed to a 50 percent reduction in demand for groundwater abstraction from the Kuseb River Delta. Secondly, the municipality has implemented a system whereby sewage effluent is semi-purified as ‘grey’ water and piped to houses for use in gardens. Future plans for a desalinisation plant have not been ruled out but for now the local area manages its water supply through capture and re-use techniques which are aligned to the scale and form of urban development.

Source: The authors; Walvis Bay Municipality [www.walvisbaycc.org.na](http://www.walvisbaycc.org.na);  
<http://www.water-technology.net/projects/swakopmund/>

## Case Study 14 South Australia: Integrated Strategic Planning

The state of South Australia, Australia provides a useful case study of how strategic planning across multiple sectors can be integrated. The Government of South Australia (GoSA) has prepared a suite of strategic plans to provide strategic direction in the medium to long-term and guide planning, investment and service or program delivery. These plans are:

- South Australia's Strategic Plan (SASP)
- The South Australian Planning Strategy
- The Strategic Infrastructure Plan for South Australia (SIPSA); and
- The Core Directions of the Integrated Design Commission for South Australia (IDC)

The overarching plan – SASP – is structured within six interrelated objectives which are:

- Growing Prosperity
- Improving Wellbeing
- Attaining Sustainability
- Fostering Creativity and Innovation
- Building Communities
- Expanding Opportunity

Each objective then includes a series of targets that will contribute to attaining the objective and strategic vision for the State. The spatial manifestation of this plan is presented in the South Australian Planning Strategy which identifies future growth areas for residential, industrial and commercial development and also, those areas where development shall not occur. It sets out how the South Australian Government proposes to effectively manage population and economic growth and change, preserve the environment and respond to the challenges associated with climate change and water security.

The development of the SASP was informed by a range of studies and other strategic documents, including the GoSA 'Water for Good' which is a twenty year strategy for the management, conservation and development of the city of Adelaide's water resources. The strategies and targets set out in this document are included in the SASP and reflect the GoSA vision to reduce water use and sustainably manage water resources through adaptive management frameworks and regular monitoring evaluation of progress.

To service this vision, the SIPSA provides a ten to fifteen year framework to guide all levels of government, the private sector and the community in the planning, delivery, management and use of infrastructure across the state. This plan incorporates four broad strategies:

- To coordinate infrastructure planning and construction across the state
- To pursue more efficient and competitive infrastructure systems
- To pursue and promote sustainable development through sound planning and use of infrastructure
- To meet future demands in a timely and innovated manner

The aim of the IDC is to embed integrated design principles within a whole-of-Government approach to ensure that this thinking is reflected in development.

This strategic framework and integration of plans represents a practical example of government and sector integration. Looking specifically at integrating water management

with urban planning and how this was achieved at a policy and implementation level, it is necessary to look at the strategic plan framework and more specifically the planning mechanisms in place to facilitate this integration. The South Australian Planning Strategy is, as mentioned above the spatial representation of the SASP. In order to facilitate delivery of both plans a series of supporting operational and implementation plans are required. At a local planning level, local authorities are required to produce a Development Plan. This plan reflects the State-level strategic vision and requirements within a local context and with regard to a local situation(s). The preparation of the Development Plan is undertaken by individual local authorities in consultation with the State government planning agency. The final plan requires sign off by the Minister for Local Government and Planning – this sign off confirming the plan is in accordance with strategic direction for the state.

At a more detailed level and ensuring consistency across plans, the GoSA initiated the Better Development Plan (BDP) program. The output of this initiative was the production of standardised modules that local authorities can use as the base for the preparation of their development. Importantly these modules align with the SASP and the SIPSA, and from a water management perspective the modules include the fundamental principles of water resource management – catchment level, supply and onsite management. It is the production of these modules that represent the final ‘thread’ or ‘link’ across the whole system of planning – strategic through to policy to operational.

At the implementation level, SA Water, as the body responsible for the supply and management of the State’s water aligns also with this framework through the development of its business plan that is consistent with the overarching strategic framework. Moreover, SA Water publically acknowledges that it has a role to play in realising the SASP and that it will actively work with government, business and the community to work towards the SASP’s 79 measurable targets.

At development level what this strategic framework and planning policy achieves is certainty to real estate developers as it is known what type of development will occur and where, and the associated service and infrastructure requirements. Most importantly though, it embeds cross-institutional working, strategic planning principles and consideration of water and its management at all stages – strategic, policy and implementation.

Source: Department of the Premier and Cabinet Circular, May 2004 (Amended August 2010)

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