

Chapter 7

How sustainable cities can contribute to Africa's development

Urbanisation can be an important driver of Africa's sustainable development. As Chapter 6 shows, however, this requires new, more effective urban development policies. This chapter identifies the main channels through which urbanisation can accelerate economic, social and environmental development, as well as the policy options to seize those opportunities for structural transformation. Good practices in Africa highlight the need for place-based and participative policies to develop more sustainable cities.

In brief

Urbanisation is playing an essential role in improving sustainable development outcomes in Africa, although it also brings new challenges as Chapters 4 and 6 highlighted. This chapter demonstrates in detail that urbanisation has been improving Africa's prospects for structural transformation through economic linkages and social innovations. New urban development policies can better harness the potential of sustainable cities to foster three types of development:

- economic development, through higher agricultural productivity, industrialisation, more productive urban services and foreign direct investment (FDI) in urban corridors
- social development, by providing cost-efficient transport systems, safer housing, social safety nets, social businesses on a larger scale and safer cities
- environmental development, by sustainably managing natural resources, notably by providing better access to renewable energy, safe water and sanitation, and sustainable waste collection. Managing urbanisation well will be essential to bridge the energy gap, mitigate the rising cost of air pollution and preserve surrounding ecosystems such as urban wetlands.

An annex to the chapter explains the method used to map FDI flows to African cities.

Urbanisation improves the conditions for Africa's economic development

Urbanisation can contribute to economic development and structural transformation through four main channels:

1. **higher agricultural productivity and rural development**, by better connecting rural economic activities, in particular food production chains, to large urban markets
2. **industrialisation**, by providing a favourable business environment where companies realise economies of scale and share knowledge more easily
3. **services-led growth**, by encouraging innovation and developing the skills of the urban labour force, which will increase the supply of modern services for the growing urban middle class
4. **more FDI in African cities**, by attracting investment through better connected urban corridors.

Urbanisation is changing the labour and food markets

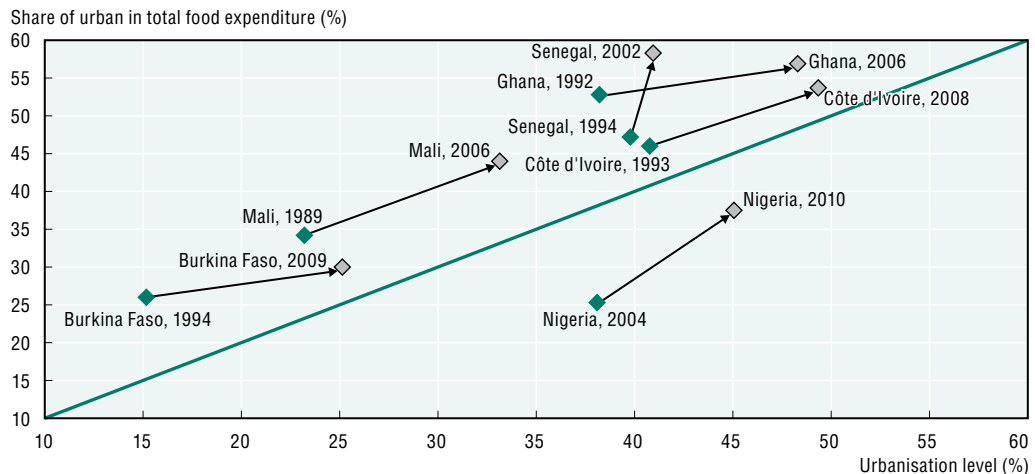
Africa's urbanisation could increase agricultural productivity and rural development by changing the labour and food markets. Between 2000 and 2013, Africa's agricultural sector has maintained a real growth rate of 5.1% per year, well above the population growth rate of 2.7%. Africa's food system is fundamentally changing, and urbanisation plays a central role in this process. Urbanisation i) creates upward demand for food production in Africa; ii) increases efficiency in post-farm segments; and iii) transforms the rural on-farm and non-farm economy (Reardon and Timmer, 2014). Different types of cities play specific roles in realising these transformations.

Urbanisation increases the consumer base for African food producers

Urban markets have become the main destination of African food production. Domestic and intra-Africa trade account for 95% of the sub-Saharan African food market. The urban sector currently accounts for 40% of the total population, 50% of total food consumption (including home production) and 60% of the food market

(Reardon et al., 2013). Food imports from outside of Africa account for less than 5% of the total food market, although large differences appear between countries.¹ Figure 7.1 shows that urban food expenditure increased faster than urbanisation in six West African countries between 1990 and 2010. Even if Nigeria's urban households, for example, spend a lower share of their expenditure on food (at 55%) than rural residents (at 72%), they still spend more in absolute terms thanks to their higher incomes.

Figure 7.1. Change in urbanisation levels and urban share of total food expenditures for major food groups in six West African countries, 1990-2009



Note: Major food groups include cereals, roots and tubers, pulses, oils and oilseeds, fruits and vegetables, animal products and fish, beverages, and other food products.

Source: Adapted from Table 6.3, AfDB/FAO (2015) and World Bank (2015a).

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The more diverse food diets of urban dwellers can raise productivity levels. Following Bennett's law, African consumers are changing their food preferences from starchy staples towards higher-value processed and pre-prepared food as they become wealthier (De Haen et al., 2003; Popkin, 2001; see Box 7.1). While Asian exporters dominate Africa's grain markets such as wheat and rice, urban consumers increasingly consume locally available meat and fresh fruits. The African urban middle class² does not consume a higher share of imported food out of its total consumption than the urban poor. Local products also generate higher margins for farmers: selling meat and dairy products to towns and cities can increase farmers' income 5 to 10 times per hectare compared to grains (Tschirley et al., 2015a).

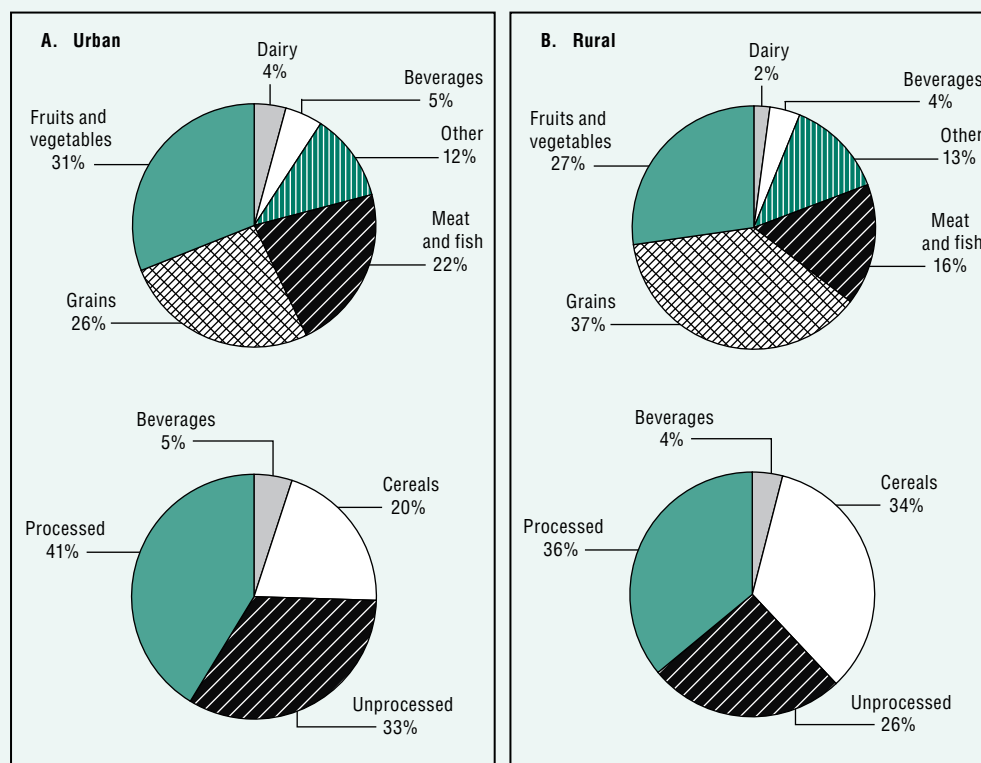
In rural areas too, markets increasingly supply food. This is due to more diversified rural economies, spreading urban products, changing lifestyles and farming methods, and better transportation. Stronger rural-urban linkages are helping the rural supply chain meet the demand of urban areas. Evidence abounds of farmers who have increased their production when connected to growing urban and regional markets (Reardon et al., 2013). This is the case of farmers growing teff in Ethiopia, vegetables in Mali or Senegal, or potatoes in Rwanda or of dairy farmers in Kenya. They have invested in soil conservation, added organic matter into their soils, used productivity-enhancing seeds, breeds and fertiliser, as well as irrigation and machines.

Box 7.1. Urbanisation and the emerging food economy in West Africa

Urbanisation has led to more diversified diets in 17 West African countries. Fruits and vegetables, meat and fish now account for 50% of urban households' total food expenditure, while consumption of cereals and pulses is declining. All income groups show higher demand for convenience, reflected in the expansion of street food and stronger demand for processed and pre-prepared foods. Processed foods represent 41% of food budgets for urban households, compared to 36% for rural households (Figure 7.2).


The West African food economy is estimated at USD 178 billion for 2010. This represents 36% of regional gross domestic product (GDP), making it the largest sector of the West African economy. In many countries, the domestic food market is becoming more attractive for farmers than traditional export cash crops. The non-agricultural post-harvest activities of the food economy, such as processing, logistics and retail, are developing quickly. The Sahel and West Africa Club estimates that, today, these activities account for 40% of the sector's value added and will continue to expand with more urbanisation (Allen, forthcoming).

Figure 7.2. Composition of the West African food basket by food groups and area, 2010



Note: The sample includes 17 West African countries: Benin, Burkina Faso, Cabo Verde, Chad, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone and Togo.

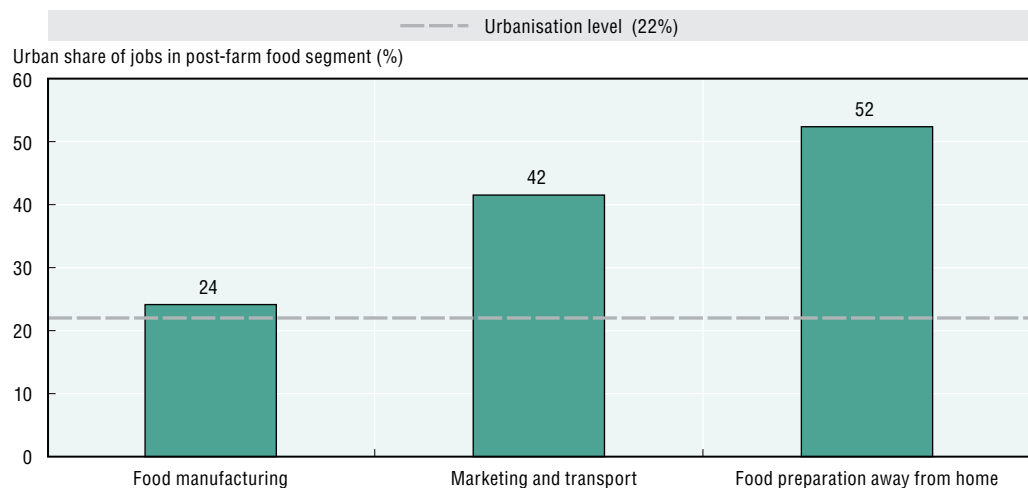
Sources: OECD (2013a).

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Urbanisation can benefit the post-farm food value chain


More densely populated places tend to support post-farm segments of food value chains, i.e. activities beyond primary production. These include wholesaling, processing, logistics, distribution, retails and food stalls, which benefit from the economic effects of more concentrated urban areas. The larger pool of urban customers enables firms to avoid under-utilisation and other seasonal effects. Research and development and agricultural extension – training farmers in innovative practices and technologies – benefit from linkages with universities and research institutions, nurturing the cross-sector fertilisation of ideas (Jacobs, 1969). Similar to Asia, a “Quiet Revolution” is emerging in African supply chains whereby small and medium-sized enterprises lead investments in post-farm activities such as trucking, wholesale, warehousing, cold storage, processing and retail (Reardon et al., 2013). In six African countries, urban areas account for 42% of jobs in food marketing and transport and 24% in the food manufacturing segment, even though urban dwellers represent only 22% of the total population (Figure 7.3). Indeed, the efficiency of post-farm activities depends on basic infrastructure available in urban areas and on the connectivity between farms and their urban markets. Efficient transport and electricity are necessary to attract productivity-enhancing investments in cold-chain and storage facilities.

Figure 7.3. Urban share of jobs in each post-farm food segment in six African countries



Note: These six African countries include Ethiopia, Malawi, Mozambique, Tanzania, Uganda and Zambia.

Source: Adapted and recalculated from Table VI in Tschirley et al. (2015b).

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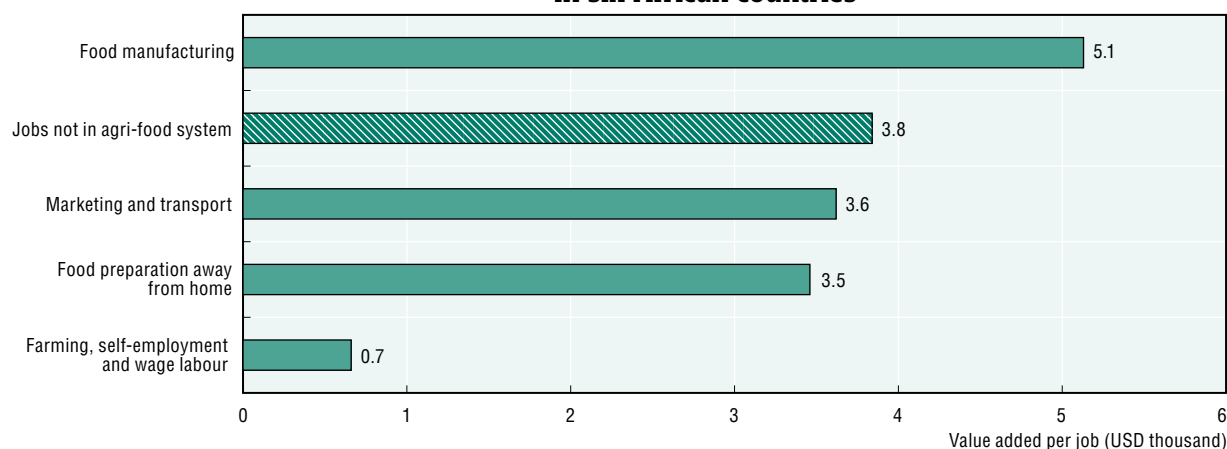
These post-farm segments of food production offer strong potential to increase the efficiency of the food value chains. In the six African countries mentioned above, the post-farm food segments already account for a total of USD 31 billion, or 39% of domestic food expenditure (Tschirley et al., 2015b). Agglomerations in secondary cities create opportunities for further investment in cold-chain and storage facilities. Such investments are key to enhancing productivity in particular by reducing food spoilage. Total food spoilage could feed about 300 million people per year in sub-Saharan Africa (FAO, 2011). Secondary cities and towns also play an important role in enhancing the efficiency of wholesale markets and supply chains and in helping increase human capital to meet the new skill demands of the food system.

In some countries, the development of supermarkets contributes to modernising food production (Reardon and Timmer, 2014), but policies are needed to avoid harming traditional small and medium producers and retailers. Demand from supermarkets can accelerate the trend towards farms' formalisation and commercialisation, by exposing farms to modern technologies through demand for more efficient supply chains. Local supermarkets can also cut intermediary costs by contracting directly with farmers. However, this process of commercialisation can create barriers to entry for small and medium producers and processors. These are typically family farms, which make up the large majority of actors in the food value chain. Ensuring that supermarket development benefits the poor requires a sequenced approach, both fostering productivity, competition and technological learning and applying safeguards for the poor through regulation. Involving retail corporations, smallholders and local communities in adapting regulations over FDI entrance, zoning and opening hours, sourcing requirements, food waste and environmental standards can help ensure proper design and implementation (Altenburg et al., 2016). Opportunities to develop alternative short supply chains should be fostered to diversify food chains and retail options in the interest of both producers and consumers.

Urbanisation can transform the rural non-farm economy


More productive rural non-farm jobs flourish in close proximity to cities and towns. Farmers close to urban areas can also take advantage of employment opportunities in urban and peri-urban areas for seasonal work. The rural non-farm economy needs to sell goods and services in urban areas to function properly. The emergence of local food industries and processing facilities creates more productive employment opportunities than the farming segment, where harvests take up on average three months of labour per year. In Ethiopia, rural households are 30% more likely to start a non-farm enterprise when they are close to clusters of micro-enterprises, and 7% more likely when they are close to clusters of big manufacturing firms in urban areas (Ali and Peerlings, 2012). Labour productivity is highest in food manufacturing, followed by marketing and transport and by food preparation away from home (Figure 7.4).

Figure 7.4. Labour productivity in different segments of the agri-food system in six African countries



Note: These six African countries include Ethiopia, Malawi, Mozambique, Tanzania, Uganda and Zambia.

Source: Authors' adaptation from Table II of Tschirley et al. (2015b).

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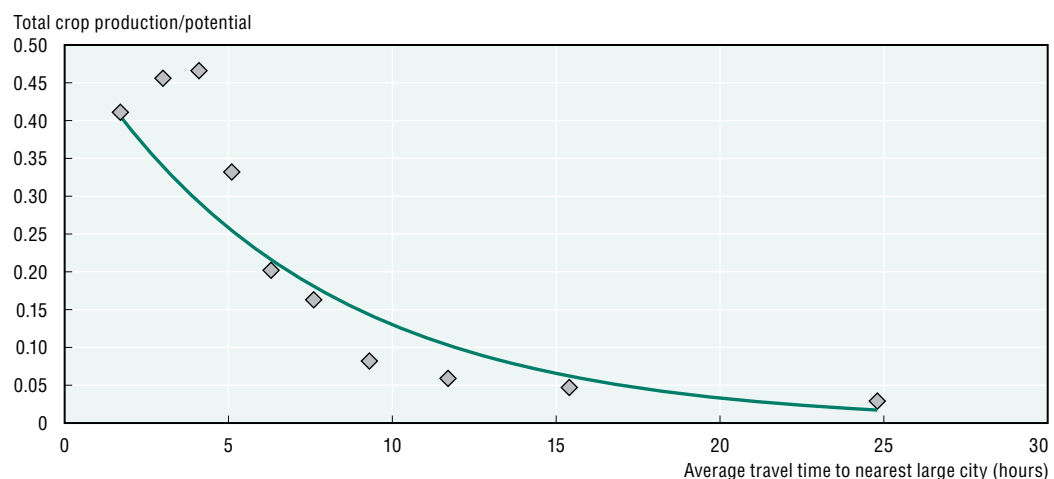
Non-farm activities supported by urbanisation can improve agricultural productivity in four main ways:

1. Income from circular migration and rural non-farm employment is a major purveyor of funds for farm investments.
2. Urbanisation facilitates the development of credit markets and other farm input markets including fertiliser, other farm chemicals, water and machinery, and land rental and purchase/sale markets.
3. Rural workers can buy services from local markets and specialise in their own productions. Specialisation can improve annual labour input per agricultural worker which is an important factor explaining the annual output gap between agricultural and non-agricultural workers. In Ethiopia, Malawi, Tanzania and Uganda, agricultural workers provide 700 working hours a year compared with 1 900 hours a year by non-agricultural workers (Resnick, 2015).
4. Relieving workers from farms increases the land-labour ratio and enables agriculture to adopt modern technologies that are more capital-intensive. In many countries such as the Democratic Republic of the Congo (DRC), Rwanda and Uganda, the availability of arable land is already very low at less than 0.2 hectare per rural worker.

Big and intermediary cities play different roles in the rural transformation


Cities and towns of different sizes play different roles in the transformation process that builds on reciprocal rural-urban linkages. Reardon and Timmer (2014) classify human settlements into three types of zones according to their stage in the transformation. The first, “dynamic, commercial zones”, are the large and medium cities and the surrounding areas within their eight- to ten-hour catchments. The second, “intermediate zones”, facilitate the rural-urban food supply chains and provide economic pull for rural supply. Their climate and ecological conditions offer medium to high potential for agricultural development, however they have not fulfilled this potential yet. The third, “hinterland, traditional, semi-subsistence zones”, are more remote and face much higher ecological and climatic challenges in developing agriculture.

Figure 7.5. Travel time and crop production in sub-Saharan Africa, 2000



Note: Each diamond represents travel time deciles based on estimated time to the nearest city with 100 000 or more inhabitants. The line represents an exponential fit of the ten average points. Total crop production/potential measures the ratio of actual crop production (in value terms) to potential crop production (determined by agro-ecology and agronomic characteristics of individual crops and regions).

Source: Dorosh et al. (2012).

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Tanzania offers examples of the first two types of zones. Its primary city, Dar es Salaam, is more advanced in retail transformation than two of its secondary cities, Arusha and Mwanza (Ijumba et al., 2015). Large supermarkets and new formats of retail centres often start in Dar es Salaam before gradually expanding to intermediary cities. Nonetheless, secondary cities connected to global markets can play a complementary role to primary cities: Arusha is more advanced than Dar es Salaam in food processing, with more complex product packaging and more companies having larger national coverage. Productivity in farming, logistics and wholesales depends on their proximity to different types of urban centres. Cities that emerge from rural-urban agricultural linkages, such as the peanut basin in Kaolack, Senegal, have a stronger impact on the development of surrounding rural areas than cities growing as enclaves around extractive activities such as mining (Reardon and Timmer, 2014). In addition, improving access to road infrastructure and urban markets could increasingly exploit agricultural potential in the long term. Dorosh et al. (2012) estimate that reducing the travel time to the nearest city of 100 000 inhabitants from 24 to 4 hours increases the ratio of actual to potential crop production by 16 (Figure 7.5). Greater agricultural production also develops the rural non-farm sector in countries at a lower stage of the post-farm food value chain, creating a virtuous circle of agricultural and rural development.

Cities can provide enabling conditions for Africa's industrialisation

Urbanisation can create a demand for industrial products, thereby contributing to structural transformation. Rising incomes shift the household demand towards industrial products, while the middle-class preference for diversity allows value-creation through differentiation. Moreover, mending Africa's infrastructure deficit and building new cities, housing and commercial properties will generate tremendous demand for construction materials and supporting industries. The infrastructure deficit for sub-Saharan Africa alone stands at more than USD 93 billion a year (Foster and Briceño-Garmendia, 2010).

Cities also generate agglomeration economies, which can be classified into three functions: **matching, sharing and learning** (see Chapters 4 and 6; Kayizzi-Mugerwa, Shimeles and Yaméogo, 2014). First, cities can help firms mix and match their unique requirements for labour, material inputs and premises. The concentrated pool of workers and supply industries allows firms to specialise in their comparative advantage and outsource uncompetitive activities. Subcontractors can take advantage of the group of potential customers inside the clusters to scale up their operations.

Second, the larger scales of cities facilitate access to a wider range of shared services and infrastructure. The concentration of users spreads the fixed cost of indivisible goods and facilities such as public mass transportation, skill training centres, universities and machineries. Investments in cities offer surrounding regions better connectivity to national and global customers. Cities provide a diverse range of inputs that enable increasing returns through product specialisation.

Third, cities enable knowledge sharing and the cross-fertilisation of ideas. Proximity facilitates communication and sharing complex ideas among firms, research hubs and related actors through a process of comparing, competing and collaborating. Close contact generates the trust and formation of formal and informal networks of innovation. The innovation-generated productivity gains attract mobile capital and talent to enforce a virtuous circle of endogenous growth.

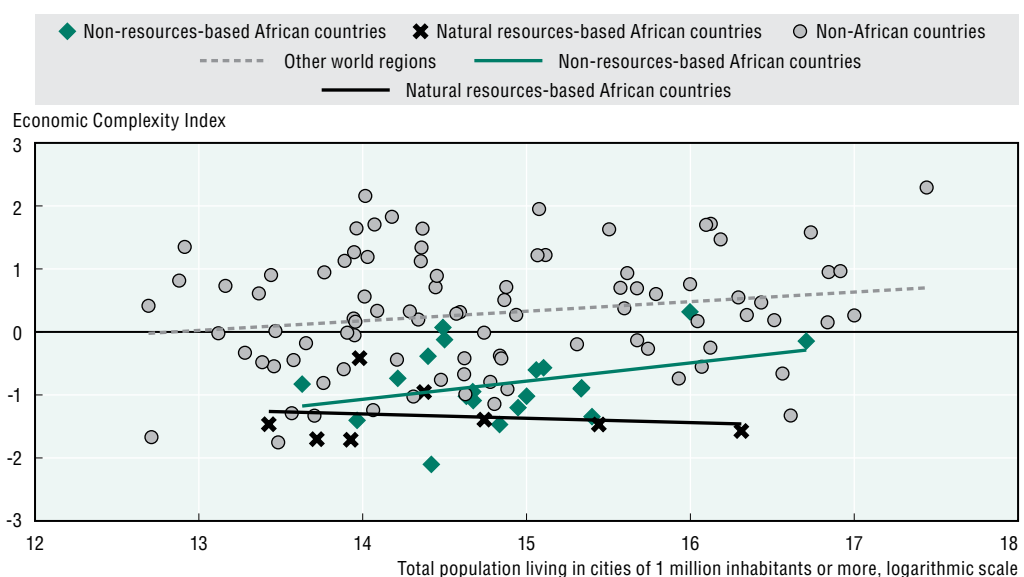
A few empirical studies point to a positive relationship between agglomerations and productivity in Africa. However, robust evidence is scarce because of the dearth of quality data and the difficulty of disentangling agglomeration economies from other economic variables. Most studies find that there is a greater presence of **localisation**

economies from a concentration of firms in the same industry, than **urbanisation economies** stemming from a concentration of firms in various industries:

- Firm-level surveys from Arusha, Dar es Salaam, Mbeya (Tanzania) and Kampala (Uganda), show that increasing the number of firms in the same industry and area by 10% would cut down costs for firms by 0.3-0.4% on average (Iimi, Humphrey and Melibaeva, 2015).
- Using an enterprise census in Ethiopia and controlling for endowment, Siba et al. (2012) find that the entry of each new firm in a cluster increases by 0.91% the total factor productivity of its competing co-locators that produce the same products, but not the total factor productivity of its co-locators producing different products.
- Also in Ethiopia, information sharing enables clustered horticulture farms to achieve a 91% higher sales revenue per worker, a 210% higher value added per worker and a 273% higher gross profit per worker (Mano and Suzuki, 2013). Agglomerated farms frequently share technological knowledge and market information that help improve product quality, deal with diseases and insects, and make decisions based on consumer demands.


Big cities can facilitate innovation and the adoption of new technologies, enabling diversification into new industries and high-tech manufacturing. At a macro level, an economic base with different industries is generally better at absorbing external market risks, such as unpredictable global conditions and fluctuating commodity prices. From a micro perspective, these diversified cities fulfil “nursery” roles by developing new products and trying business processes borrowed from different activities (Duranton and Puga, 2001). This process of trial and error through deductive tinkering adds to the country’s know-how and complexity. This can be measured by the Economic Complexity Index for each country through its export basket. For non-resource-based African countries, the size of the population living in cities of at least one million inhabitants correlates with the country’s level of economic complexity (Figure 7.6). This pattern is also present for the global sample yet not exhibited in the *resources-based* economies among the five country groups presented in Chapter 6.

Figure 7.6. Population size of big cities and level of economic complexity, 2013



Note: The green solid line is the linear fit for non-resources-based African countries. The black solid line is the linear fit for the group of *natural resources-based* African countries. The dotted line is the linear fit for non-African countries.

Source: Population data from UN DESA (2014) and Center for International Development at Harvard University (2016).

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By contrast, intermediary cities can specialise in and foster the development of mature industries. Once they have mastered the business processes leading to specialisation, firms switch to mass production and relocate to specialised cities in search of lower production costs. Labour-intensive industries such as textiles thrive in the intermediary cities that offer cheaper labour, land and other inputs for firms and their suppliers.

Cities have supported industrialisation

Cities and urbanisation will play important roles in industrialising Africa. The automobile industry in Durban (South Africa), Casablanca and, more recently, Tangier (Morocco) relies on the skilled-labour pools, available local know-how and interconnected networks among various stakeholders such as universities, research institutions and business associations that epitomise the power of cities. Mauritius' success in textile industries relied heavily on the shipping capacity of Port Louis and on connective infrastructure between the export processing zone and raw cotton producers (Ramdoo, 2014). Similarly, one-third of Tunisia's firms are concentrated in two central business districts – Tunis and Sfax – to take advantage of the close proximity to their consumer base (Ayadi and Mattoussi, 2014). Exporting industries tend to agglomerate in specific provinces, such as textile firms in Monastir, chemical firms in Ben Arous and agro-food firms in Sfax and Nabeul. In most African countries, despite some successes, urbanisation has yet to support industrialisation on a larger scale. Examples abound of cities developing their own manufacturing base, generally in the informal sector, which can export intermediate and consumption goods to other African countries (Box 7.2).

Box 7.2. Intermediate cities can develop their manufacturing base

Several intermediate cities in Africa are developing a manufacturing sector based on trade and the existing informal economy.

- Since the late 1990s, Nigeria's Otigba cluster in Lagos has developed into a sub-regional hub for computer assembly and repairs and for the manufacturing and sales of computer parts.
- Similarly, Nnewi, a city of 750 000 inhabitants in Eastern Nigeria, upgraded from trading imported Japanese automobile spare parts in 1980s to being the manufacturing base of Nigeria's automobile sector. Today, 70% of automobile components used in Nigeria are sourced domestically, mostly from Nnewi.
- In Ghana, the city of Kumasi houses Suame Magazine, a cluster of artisanal workshops for metal engineering and vehicle repairs. As many as 200 000 people work there with complementary skills such as smelting scrap metal, trading automobile parts, fine-tuning truck engines, and retrofitting electronics. To support common challenges faced by firms in the cluster, Suame Magazine Industrial Development Organisation has been working to scale up training and local manufacturing.

Cities provide an entry point for industrialisation policies

Cities provide a possible entry point for efficient policies that can revive manufacturing industries in Africa. The lack of input industries, weak trade logistics, limited access to finance and to industrial land, as well as a dearth of technical and entrepreneurial skills, are often binding constraints to Africa's light manufacturing industries (Dinh et al., 2012). Policies that address them in a co-ordinated manner through "place-based approaches" can exploit synergies, improve accountability and better link governments with the private sector. Cities also provide a testing ground for policy implementation before multiplying to national scales.

Supporting the **clustering of firms** can reduce the per-user cost of programmes such as infrastructure development and allow for spill-overs among enterprises. In 11 African countries, clustering has an overall positive impact on firms' performance (McCormick and Oyelaran-Oyeyinka, 2007). For example, 72% of the clustered firms surveyed felt that clustering enhanced their exposure to different useful ideas and provided them with opportunities to seek common solutions and strategies for shared problems. Subcontracting within the clusters has helped Uganda's fish processing firms to meet European markets' changing standards and trade terms. Firms in the Durban Automotive Cluster co-operated in supplier development, human resource development, logistics and benchmarking. In Tunisia's garment industrial clusters, borrowing and lending tools is common so as to avoid underutilisation of machinery.

In supporting industrial clusters, government action proves more successful when playing a facilitating role rather than a leading role. For example, special economic or exporting zones in Africa are often government-driven initiatives seeking to concentrate investment in one region to jump start export-oriented industries such as automobiles, food processing and textiles. However, notwithstanding the sustained success of Mauritius' early textile and clothing clusters, most have been hampered by various factors, ranging from bad locations to heavy reliance on trade preferences (Farole, 2011). Table 7.1 provides examples of instruments governments can use to support industrial clusters indirectly.

Table 7.1. Examples of instruments for cluster policies in developing countries

Labour mobility	<p><i>Recruitment of qualified recent graduates</i>: job fairs, public relations initiatives for the clusters</p> <p><i>Labour mobility among companies and research institutions</i>: direct matching between employers and qualified job-seekers, secondment programmes</p> <p><i>Apprenticeship inside clusters</i>: job and internship information, scholarships for placements, direct matching</p>
Entrepreneurship	<p><i>Spinoff formation</i>: entrepreneurship or business plan competitions</p> <p><i>Venture capital</i>: allocation of venture capital, direct coaching for spinoffs, development of business incubators out of technology centres</p>
Inter-firm co-operation	<p><i>Horizontal co-operation among companies</i>: formation of industry associations or working groups, financial incentive for intra-industry co-operation</p> <p><i>Vertical co-operation among companies</i>: management of co-operation projects, financial support for collaboration, shared use of leading companies' infrastructure, intra-cluster networking events, formation of industry associations</p>
Competition	<p><i>Intensive local competition</i>: public procurement, standardisation and certification, targeted subsidies for exporters</p> <p><i>Competition in the local social hierarchy</i>: entrepreneur awards, social media</p>
Public-private engagement	<p><i>"Cafeteria effects"</i>: establishment of technology centres, use of public research infrastructure by industry</p> <p><i>Social networks</i>: field visits and networking events, exchanges or secondments of professionals, collaboration in designing a strategy for a cluster competition</p>

Source: Adapted from Benner (2013).

Infrastructure policies are essential to activating the comparative advantages of all cities. Firms need supportive infrastructure, especially transport and energy, to avoid being spatially trapped inside crowded city centres. In Africa's more diversified economies, automobile sectors have started in primary cities such as Casablanca and Johannesburg. A combination of environmental regulations, spatially targeted investments in physical and soft infrastructure and business networks have enabled mature automobile sectors to shift to secondary cities such as Tangier and Durban. The experience of Thailand has shown that appropriate place-based government intervention can help develop heavy industries and add value to the extraction of natural resources. The country developed petrochemical industries in the Eastern seaboard following the discovery of gas fields in the Siam Gulf.

China's two-pronged strategy provides an example of leveraging the potential of both cities and towns in achieving industrialisation. During the reform period of 1978 to the late 1990s, township- and village-controlled enterprises drove industrialisation and diversification in rural areas, while special economic zones that were allowed to accept foreign direct investment soon became central to China's export-oriented and labour-intensive manufacturing strategy.

African cities can drive service-led growth

Urbanisation creates new opportunities for developing more productive and competitive service hubs that support Africa's structural transformation. First, Africa's service sector already accounts for one-third of total formal employment (ILO, 2014). As shown in Chapter 6, services can absorb low-skilled labour while still enhancing productivity. Second, the growth of service sectors such as tourism indirectly creates jobs in supplier industries. For example, in South Africa, 25% of intermediate inputs into services come from manufacturing (Tregenna, 2008).

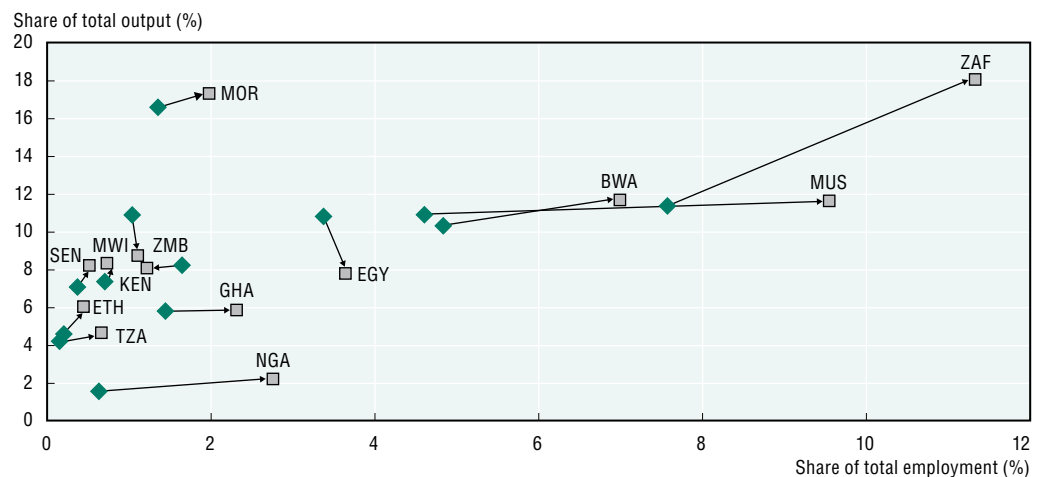
Services also play an increasing role in helping manufacturing firms to access global value chains. Goods and services are intertwined in global production networks. The value created directly and indirectly by services as intermediate inputs represents over 30% of the total value added in manufactured goods (AfDB/OECD/UNDP, 2014; Figure 6.3). Services such as transport, logistics and warehousing, but also banking, insurance, business services, professional services and communication services, play an important role at every stage of the production phase. These services facilitate efficient movements of goods and intermediate inputs across borders to reduce the cost of trade in manufacturing.


African countries have experienced growth in the output share of modern services, which are mostly based in urban areas, albeit at different paces and with uneven job creation effects (Figure 7.7). The five groups of African countries below are divided according to their stages in urbanisation, fertility transition and structural transformation, as explained in Chapter 6 (see Annex 6.A1):

- *Diversifier* countries have the highest output share from modern services such as business, transportation and communication. In 2010, business services accounted for more than 10% of total output in Mauritius, Morocco and South Africa. Mauritius and Egypt have expanded the output of transport, storage and communication sectors to about 15% of the total. Cities such as Cairo and Alexandria (Egypt), Casablanca and Rabat (Morocco), Cape Town and Johannesburg (South Africa), account for more than half the national value added in modern services. Countries such as Mauritius and South Africa have significantly shifted their workers into these highly capital- and skill-intensive sectors.
- Some *natural resources-based* countries also made significant progress in these sectors. Botswana and Nigeria, for example, have expanded their employment share in business services. Surulere in Lagos State (Nigeria) fostered Nollywood, the third biggest cinema cluster in the world.

- In the remaining groups, progress is patchy. A *late urbaniser*, Kenya in particular has significantly developed its services, with large urban centres playing a leading role: Nairobi and Mombasa account for half of the value added in financial and business services and three-quarters of the value added in the transport and ICT sectors. Some *early urbanisers* such as Ghana and Senegal have diversified so quickly into transport and communication that these sectors now account for roughly 15% of total output. However in many *late urbaniser* and most *agrarian* countries such as Ethiopia, Malawi and Tanzania, modern service sectors are still nascent: neither business nor transportation and communication account for more than 10% of output or 3% of employment.

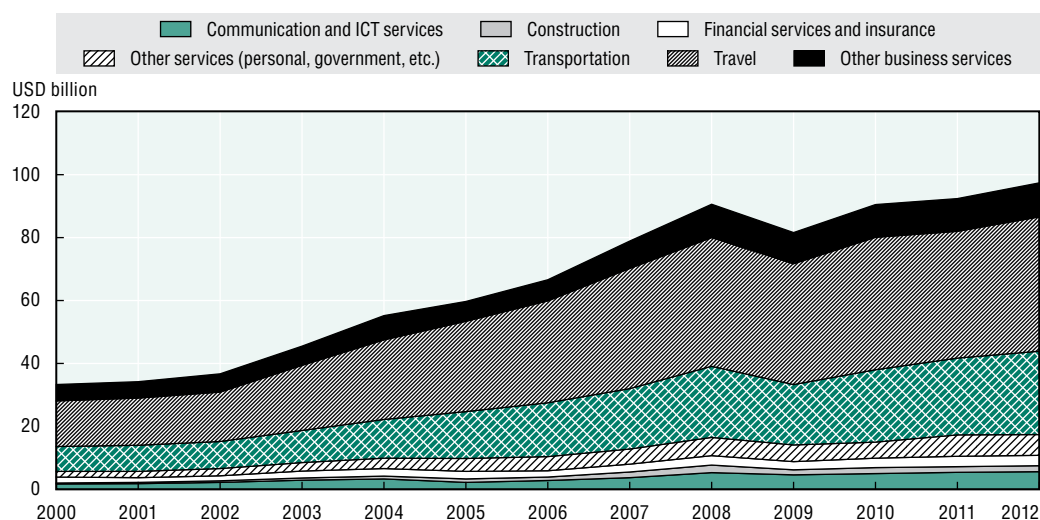
Figure 7.7. Change in employment and output of business services as a share of the total economy of selected African countries, 2000-10



Source: Authors' calculations based on Timmer, de Vries and de Vries (2014).
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In the longer term, modern, tradable services could significantly absorb more labour without losses in relative productivity. Given the underdeveloped market for modern services in most African countries, lower prices will not necessarily offset production gains in modern service sectors. These sectors are increasingly tradable: global trade in services tripled between 2000 and 2012 with transportation, tourism and business services expanding quickly (Figure 7.8). Africa has only captured 3% of the global trade in services, mostly in the tourism and transportation sectors. It can harness more of this global demand by developing more specialised services and training a skilled labour force. Modern services such as finance and business are more integrated into global value chains, particularly through the trade networks established in Southern Africa with city hubs such as Johannesburg and Gaborone. Furthermore, services are increasingly disaggregated and traded as separate tasks, allowing countries and cities to further specialise in particular segments of the service value chains. Several *diversifier* countries, as well as Nigeria and Kenya, are looking to develop their business process offshoring sub-sectors around established research centres in urban areas.

Figure 7.8. Service trade in Africa, 2000-12



Source: Authors' calculations based on data from AfDB/OECD/UNDP (2014).

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In the short and medium terms however, the informal sector should be acknowledged as a source of livelihood. Engaging informal firms through direct procurements or through contracts with enterprises that provide waste, sanitation and water purification services could offer a low-cost solution to improve community welfare. The concentration of people reduces the cost of spatially-targeted investments in education, training and skill-matching; these facilitate the transition of workers into more productive activities. A comprehensive reform package will be necessary to bring these workers under some form of legal protection, ensure minimum wages and non-wage safeguards, train them and match them with jobs for a gradual progression into higher-value, formal work.

Participatory approaches can help integrate informal firms into the urban fabric and facilitate the development of an organised formal urban sector. Appropriate regulations and targeted incentives can enable informal employers to move beyond merely subsisting to saving for and investing in productivity growth. Formal businesses in Africa often have strong links with informal firms to take advantage of their flexibility and market concentration. A participatory approach considering local specificities can be more efficient in engaging informal enterprises into formal processes and mechanisms (see Box 7.3; see also Chapter 4). In Kenya, the second-largest retailer, Tusker Mattresses, is franchising informal retail businesses to penetrate this market (Mulupi, 2016).

Box 7.3. How participatory local policies can tackle informal street trading

Informal street trading is often contained by repressive policies because it is generally perceived as an illegal activity overcrowding Africa's city centres. Police forces tend to regularly evict informal street traders by force. However, repressive policies have shown limited success in containing informal traders in the long term. Dakar and Monrovia have used more effective participatory and consultative approaches.

Box 7.3. How participatory local policies can tackle informal street trading (cont.)

The city of Dakar is building a commercial centre for former street merchants. From March to April 2011, a local census registered 4 980 street merchants who could participate. They choose their own property developer via the merchants' associations and arrange the new commercial complex according to their needs. The project's overall cost is estimated at XOF 9 million.

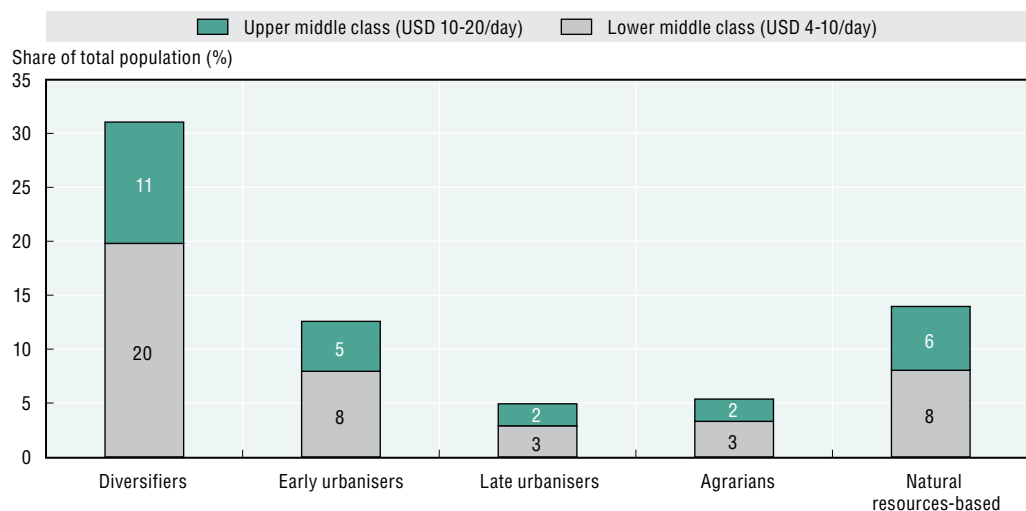
Following negotiations between 2009 and 2011, the National Petty Traders Union of Liberia and the Ministry of Commerce adopted a memorandum of agreement to define a limited trading space on the streets and give rights to petty traders. Petty traders pay fees to the municipality to obtain identification cards and taxes to the ministry to obtain these rights to trade in a designated street. Between the memorandum's adoption in 2011 and 2015, 500 street traders were registered, and conflicts with the police decreased.

Source: Authors' interviews with municipal officers of Dakar and Monrovia, December 2015.

The emerging urban middle class could fuel services growth


The middle class is growing rapidly in Africa, but it has been concentrated in *diversifier* countries (see Figure 7.9).³ Using the AfDB (2011) definition of the middle class as those with a consumption of USD 4-20 a day in purchasing power parity, a third of the *diversifier* countries' population belongs to the middle class with 11% firmly in the upper middle class in 2008. Elsewhere the middle class is still small: 5% of the population in the *late urbanisers* and *agrarian* countries and roughly 14% in *early urbanisers* and *natural resources-based* countries. Lack of inclusiveness has limited the growth of the urban middle class in *natural resources-based* countries such as Angola, Nigeria and Zambia despite their higher income level.

Figure 7.9. Share of middle class by income in Africa (%), 2008



Note: Constant 2005 purchasing power parity USD. Numbers are simple averages, unweighted for population size. Our definition does not include the "floating" middle class, those with consumption of USD 2-4 a day, since this threshold is barely above the poverty line and this group is vulnerable to falling back into poverty.

Source: Authors' calculations based on AfDB (2011).

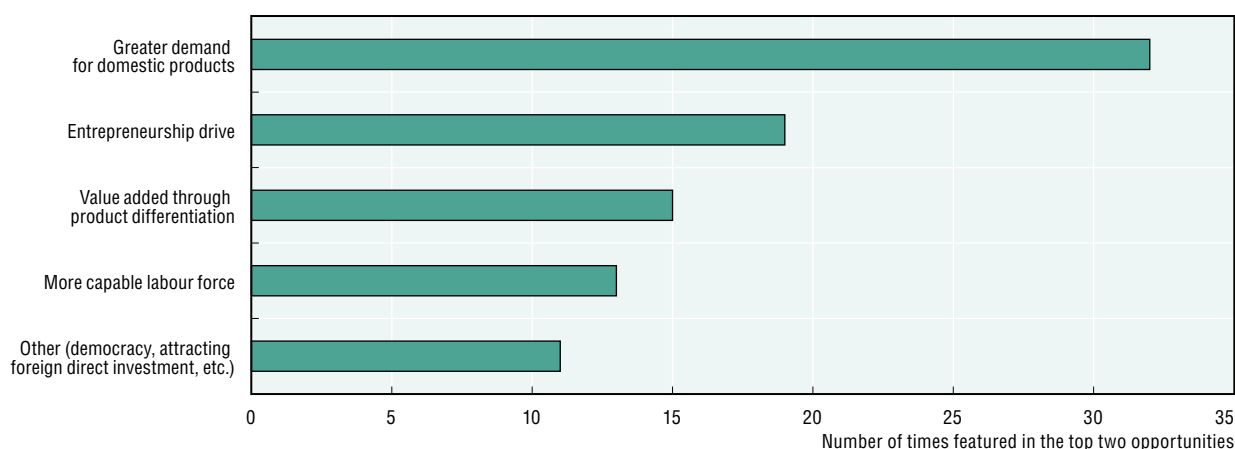
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The growth of the urban middle class can boost both supply of and demand for the domestic services sector in Africa.

- First, as they graduate from poverty, the middle class can pursue entrepreneurial activities, creating employment and productivity growth (Acemoglu and Zilibotti, 1997).
- Second, the middle class provides the workforce and resources necessary for entrepreneurs as this group values human capital accumulation and savings (Doepke and Zilibotti, 2007).
- Third, the middle class generates renewed demand for consumer goods, especially durable ones. It has a stronger preference for product differentiation that leads to value added in branding. Consumer spending in Africa could grow from about USD 860 billion in 2008 to USD 1.4 trillion in 2020 (McKinsey Global Institute, 2010).


Growth driven by expansion of the middle class tends to be more sustainable than “export-led” growth (Gill and Kharas, 2007). Our experts’ survey shows that this boost in demand is perceived as the biggest opportunity associated with Africa’s middle class, followed by their potential as entrepreneurs (Figure 7.10).

Figure 7.10. Main opportunities associated with the middle class for African countries



Note: Survey responses by country economists of the AfDB and UNDP in 45 country offices in Africa. Responses are weighted by one per country.

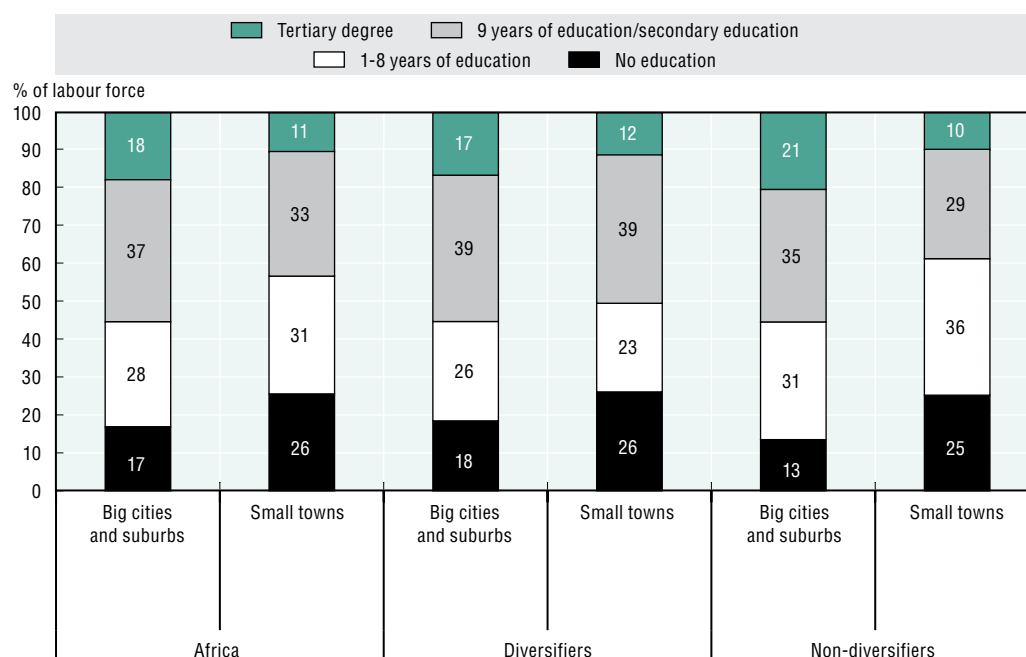
Source: AEO experts’ survey, 2016.

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The majority of Africa’s middle class resides in urban areas. In Ethiopia, Malawi, Mozambique, Tanzania, Uganda and South Africa, 63% of the middle class with a consumption of USD 4-20 a day resided in urban areas in 2010. Their urban middle class totalled 11.9 million people, or 20% of the urban population, with an annual expenditure of USD 27 billion, or 43% of total urban expenditure (authors’ calculations based on Tschirley et al., 2015: Table 4).

Realising the potential of the urban middle class as workers for skill-intensive service sectors requires a continued push for education in urban areas. Overall, Africa’s big cities have a higher share of people with tertiary degrees than towns: 18% of the population aged 15 or over in big cities have tertiary degrees as compared to 11% in towns, according to our analysis of the Gallup World Poll (2016). The gap in tertiary degree attainment is more pronounced in *non-diversifier* countries than in *diversifier* countries (Figure 7.11).

Figure 7.11. Education level of the population aged 15 years or older in Africa, 2009-10



Note: The non-diversifiers include Algeria, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Ghana, Côte d'Ivoire, Kenya, Liberia, Libya, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, Sudan, Tanzania, Uganda, Zambia and Zimbabwe. The diversifiers include Egypt, Morocco, South Africa and Tunisia.

Source: Authors' calculations based on Gallup World Poll (2016) for surveys between 2009 and 2010.

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African cities attract a growing share of foreign direct investment

Foreign direct investment to cities is strategic to develop the necessary urban base in manufacturing and services that could drive Africa's structural transformation. FDI in African cities can be analysed by using data on greenfield FDI, which represents investments where parent firms start entirely new projects and facilities in host countries (see Annex 7.A1). Although Africa has one of the highest regional growth rates of FDI at 2% a year between 2003 and 2014, its volume share of FDI compared to other regions is small. Cairo, Tunis, Tripoli and Algiers are Africa's top global FDI destinations by volume, with Cairo capturing USD 37 billion and Tunis USD 22 billion between 2003 and 2014. The top six cities are Arabic-speaking cities in North Africa, while the Anglophone cities of sub-Saharan Africa rank lower. Johannesburg and Cairo are Africa's prime global cities, one anchoring the south of the continent to the world economy, the other the north. Johannesburg is the first source city of African FDI (71st globally), but ranks seventh as an FDI destination (104th globally). Cairo is second in terms of FDI source and first in terms of destination. With regard to FDI from within Africa, the most popular destinations are Cairo (18%), Luanda (11%), Lagos (10%), Tunis (6%) and Johannesburg (6%). Maps 7.1 and 7.2 show the global FDI networks investing in the main African destination cities for manufacturing and services, respectively (Wall, 2016; forthcoming).

African cities attract higher levels of greenfield foreign direct capital investment than would be expected considering city GDP levels (World Bank, 2015b). Relative to GDP, sub-Saharan African cities featured in the top 10% attractors of greenfield FDI between 2002 and 2012, as often as cities in the East Asia and Pacific region. In Morocco,

Tangiers has utilised national investment in a large new seaport facility and connective infrastructure from the port to the surrounding hinterland to attract a European automobile assembly line. City stakeholders collaborated with the national investment promotion agency and helped set up a dedicated training centre to upgrade the local labour force and address the skill shortage of the automotive sector.

Cities of various sizes can form economies of scale through clustering to attract investors. Regional integration, complementarity and collaboration are essential to improving a city's competitiveness. Africa has four major "FDI corridors": i) a North African corridor including Casablanca, Tunis and Tripoli; ii) a Nile corridor including cities like Cairo; iii) a West African corridor including Lagos, Abuja, Abidjan and Accra; and iv) a Gauteng-Maputo corridor which includes cities like Johannesburg, Midrand, Pretoria and emerging Maputo (Wall, 2016; forthcoming). These corridors attract FDI because they are comprised of several primary cities at close proximity to each other and connected through good networks of road, rail and port infrastructure. The West African corridor sees a high concentration of big cities like Lagos, Abuja, Lomé, Accra and Abidjan, which benefit from dense clusters of secondary and tertiary cities and complement each other in a reinforcing urban hierarchy. Finally, each of the four powerful regions depends on globally well-established cities like Johannesburg, Cairo, Casablanca and Lagos to anchor them to the global economy but also on rising investment destinations like Maputo and Kigali.

FDI into urban Africa is both "market seeking" and "resource seeking". Econometric analysis shows that the most significant determinants of FDI in Africa's manufacturing sector are domestic market size and infrastructure (e.g. ports, rail and road) to access natural resources. These two factors explain 28% of variations in FDI attraction to Africa. For comparison, technological readiness is the most powerful explanatory factor of foreign investments in Asia, followed by infrastructure and market size. Hence, the types of technology-sensitive investments that dominate FDI in Asia are not yet present in Africa. Expanding Africa's base in advanced manufacturing may imply further investment into a country's technological absorption capacity, improve the ease of doing business and implement efficient customs regulations.

Foreign investment in Africa's high-tech sector is much more concentrated in fewer highly urban areas than is the case of other sectors (Map 7.3). The quality of infrastructure (road, rail, airports and ports) is the most determinant variable for the production of high-tech goods and for their distribution. The map also shows strong clusters around Nairobi, Johannesburg, Port Elizabeth, the West Africa corridor, North Africa corridor and Cairo corridor (red regions on Map 7.3), and some emergent high-tech clusters for instance between Zimbabwe and Zambia (yellow regions on Map 7.3). Whereas Nairobi is not a hot-spot in terms of total FDI, it receives a significant flow into high-tech industries. This shows that regional strengths can vary strongly across investment sectors (Wall, 2016; forthcoming).

FDI usually brings knowledge and technology to a region, activates the development of local business, and leads to new urban projects, but it does not always directly create many jobs. In 23 African countries, trade and growth are mutually-supportive (Seyoum, Wu and Lin, 2014). However, the growth-enhancing effect of FDI stems from the productivity spill-over to domestic firms rather than from direct employment by FDI firms. The agglomeration economies from industries' locating in a given area are higher in sub-Saharan Africa when domestic firms locate close to foreign multinationals, especially those coming from developing countries from the "Global South" (Sanfilippo and Seric, 2014). By contrast, in a sample of 750 cities all over the world, FDI only created

1 400 jobs per city directly, or 0.1% of the employment base, among the FDI-recipient cities in 2012 (Fikri and Zhu, 2015). Among all the jobs directly created by FDI in Africa between 2003 and 2014, 83% were located in cities. Over the same period, FDI in manufacturing is estimated to have directly created over 646 000 jobs, or half the total of FDI-related jobs; FDI in services 281 000 jobs; FDI in high-tech 159 000 jobs; while FDI in resources (or non-urban FDI) created 220 000 jobs (Wall, 2016; forthcoming).

While the success of each investment strategy depends on specific characteristics of the city and country, Zhu, Larrey and Santos (2015) point out a four-step method for city governments: i) identify and communicate the city's value proposition through self-assessment of the city in line with regional and national strategies; ii) build the city's brand and address any negative perceptions; iii) co-ordinate with different institutions and government agencies to provide comparable, credible and timely information to investors, especially on entry requirements into the domestic market while nurturing local partners and networks; and iv) provide targeted incentives to those firms hesitating to invest and foster positive relationships with existing investors.

Urbanisation can help accelerate social development

Urbanisation provides opportunities to accelerate social development in Africa in different ways. First, urbanisation could support inclusive growth and improve material well-being through higher disposable incomes for food, shelter and investment in human capital which enhances one's potential for generating income. Second, agglomeration enables economies of scale in delivering indivisible public goods such as transportation and communication systems. Third, densification creates a web of interconnected community groups and stakeholders in cities which can more easily engage in governmental poverty alleviation programmes, or grassroots social development initiatives. Realising these benefits requires co-ordinated and holistic policies to make structural transformation more inclusive. This section highlights how new urban development policies might do the following:

- improve transportation infrastructure within and between cities to connect people, resources and ideas across regions
- improve housing conditions, income equality and gender equality
- lift vulnerable groups out of urban poverty by providing new social safety nets and public employment programmes
- expand social businesses to better tap the potential of the urban informal economy
- curb urban insecurity.

Better transportation infrastructure within and between cities can connect people, resources and ideas across regions

Transportation policies will have a significant impact on sustainable development. Continuing to develop mass transportation systems, notably public transportation, *within* cities will decrease congestion costs and contribute to more sustainable cities. Better transportation networks *between* cities will strengthen regional linkages.

Mass intra-city transportation systems can foster more inclusive development

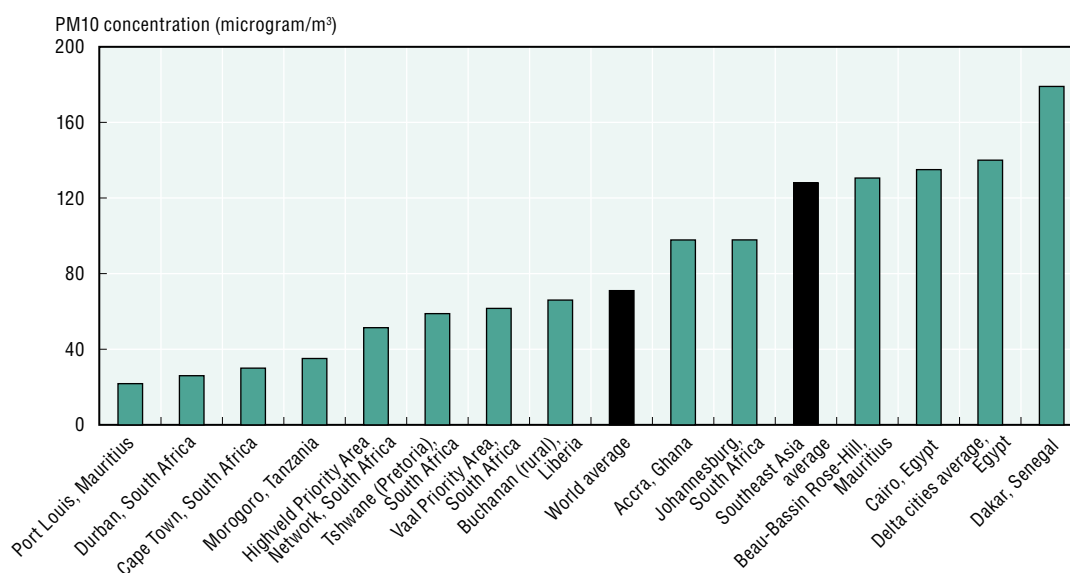
Good transportation increases the efficiency of doing business in the cities. It reduces the costs of moving goods and people and enables "just-in-time" logistic development. Experience from other regions of the world show that reducing the uncertainty of transit time is as important for increasing business efficiency as reducing transportation time.

Better connective networks allow firms to expand their catchment areas and scale up their operations thanks to a larger, more diversified pool of potential customers. Improving connections between city centres and their surrounding areas enables firms to move out of cities centres to scale up operations while reducing congestion costs (McCormick and Oyelaran-Oyeyinka, 2007).


Transportation policies play a major role in connecting the urban poor to jobs. The urban poor usually face a spatial mismatch, such as those residing in the ghettos of Johannesburg's outskirts, for example. Car-oriented transit disproportionately hurts the poor who cannot afford their own vehicles and cannot find jobs within a walkable distance from their homes. An experiment in Addis Ababa showed that reducing transportation costs could increase the intensity of one's job search, decrease participation in temporary and informal work, and increase the likelihood of permanent employment by six percentage points (Franklin, 2015a). In Lagos where transportation costs account for 20% of the urban poor's income, the Bus Rapid Transit system started in 2008 has provided 2 000 direct jobs and 500 000 indirect jobs. The system reduced the cost of public transportation by 30% and offered a more stable price even amid a fuel scarcity.

Transportation policies help curb pollution. A review of 27 African countries reveals that the majority have adopted environment protection acts, and established vehicle fuel parameters, emission standards and air quality controls (SEI, 2012). A substantial improvement has been the phase-out of lead, which started in 2003, and is now essentially completed. However, monitoring and enforcement remains limited: only eight countries have operational routine monitoring systems for air quality. The annual mean concentration of particulate matter smaller than ten microns in diameter (PM10) is higher in many African cities than the average city at global level (Figure 7.12).

Figure 7.12. Annual mean concentration of particulate matter smaller than ten microns in diameter (PM10) in selected African cities



Source: WHO (2014).

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Given that the bulk of African transport infrastructure has yet to be built to accommodate the 867 million Africans that will live in urban areas by 2050, African cities can learn from past successes and mistakes. Africa has less than 3% of the world's motor vehicles but more than 11% of global road fatalities (SEI, 2012). Making roads more friendly to non-motorised use can reduce the death and injury costs of traffic accidents. The modernist ideal of car-centric urban planning in the early 20th century has proved to be detrimental to the well-being of urban residents and environmentally unsustainable (Frenchman, 2014; Glaeser, 2012). In OECD countries, the transportation sector contributes to half of total air pollution. Many OECD countries are trying to break the cycle of car dependency and reverse their consequences at great costs. The experiences of Paris and London have shown that constructing more roads will not solve the traffic congestion problem due to the additionally generated vehicle use. Compact cities promoting non-motorised and public transportation can efficiently connect the urban flow of people, goods and ideas at a lower social cost per capita.

Some African cities are developing integrated public transport networks to break the cycle of car dependency and create better connectivity within cities. This model reflects the pursuit of efficient and integrated public transport that improves mobility, inclusivity and access in cities. Table 7.2 lists several initiatives identified in this report's country notes.

Table 7.2. Mass transportation systems in selected African cities

Project	Stakeholders	Cost	Development outcome of the project	Price per trip
Addis Abeba Light Rail, Ethiopia 2012-15	Operated by Shenzen metro group and constructed by Ethiopian Railways Cooperation.	USD 475 million (financed 85% by China Railway Engineering Cooperation)	Capacity of 60 000 passengers per hour, total length of 31.6 km for the two lines. The first 17km of rail connect the industrial suburbs south of Addis to the centre. Another east-west line is still under construction, and additional lines are planned.	ETB 2-6 (USD 0.27-0.82)
Lagos Bus Rapid Transit (BRT-Lite), Nigeria Launched in 2008	Run by Lagos Metropolitan Area Transport Authority.	USD 1.7 million per km	Africa's first Bus Rapid Transportation system serves 47 different routes, carries as many as 200 000 passengers per day who pay on average 30% less in fares and spend 40% less time travelling. The transport sector employs 2.5 million people (15% of the city's population). The system relieves congestion in the city and provides more effective public transport at lower cost.	NGN 20 (USD 0.23)
DART System (Bus Rapid Transit), Dar es Salaam/Tanzania Phase 1: 2003-present Phase 2: from 2017	Will be managed in Public Private Partnership with two private bus operators.	USD 290 million for Phase 1 (funded by the World Bank) USD 159.32 million for Phase 2 (funded by AfDB, AGTF and the Government of Tanzania)	Capacity of 495 000 passengers per day. By using cleaner fuels and reducing the roadside concentration of greenhouse gas emissions, it is environmentally efficient.	TZS 500-900 (USD 0.80-1.45)
Rea Vaya Bus Rapid Transit (BRT), Johannesburg, South Africa Phase 1: 2007-09 Phase 2: 2009-12	Financed by Public Transport Infrastructure and Systems Grant (PTIS) by central government.	USD 300 million overall	Used by 45 000 commuters per day. The Employment Framework Agreement (EFA) signed between the city and the taxi industry whose drivers received training was expected to create 700 permanent jobs in Phase 1A and 3 300 temporary jobs during the construction period.	ZAR 3.5-9 (USD 0.64-1.67)
Constantine Tramway, Algeria 2007-13	Setram/Alstom (49%), ETUSA (36%) and the Entreprise du métro d'Alger (15%), with a second line to be constructed by the French RATP.	DZD 44 billion (line 1) (about USD 400 million)	Capacity of 100 000 passengers per day over 8km for the first line. The extension will serve the new city Ali Mendjeli and the airport.	DZD 40 (USD 1.28)
Casablanca Citadis Tramway, Morocco Phase 1: 2009-12 Phase 2: 2016-18	Moroccan government, local government Alstom, CDG Capital, Banque Populaire du Maroc and King Hassan II Fund.	MAD 6 billion (about USD 400 million)	Provides service to 100 000 passengers a day over 31 km.	MAD 6 (USD 1.68)

Note: Prices are converted into international USD, 2014 prices.

Source: AEO experts' survey, 2016; AEO Country Notes, 2016.

Transportation policies are more efficient when developed in tandem with land-use planning and along urban catchment areas. Angel et al. (2015) recommend that capacity-constrained governments first focus on predicting urban growth, in order to set aside the public space for parklands and establish the arterial grid. An arterial grid of dirt roads allows allocating public space without spending much on infrastructure. The eventual spending can occur later as the city expands and new residents need more services. Involving the peri-urban population and identifying the functional catchment areas of cities help establish more coherent governance structures beyond administrative boundaries.

Better transportation networks between cities can improve regional linkages

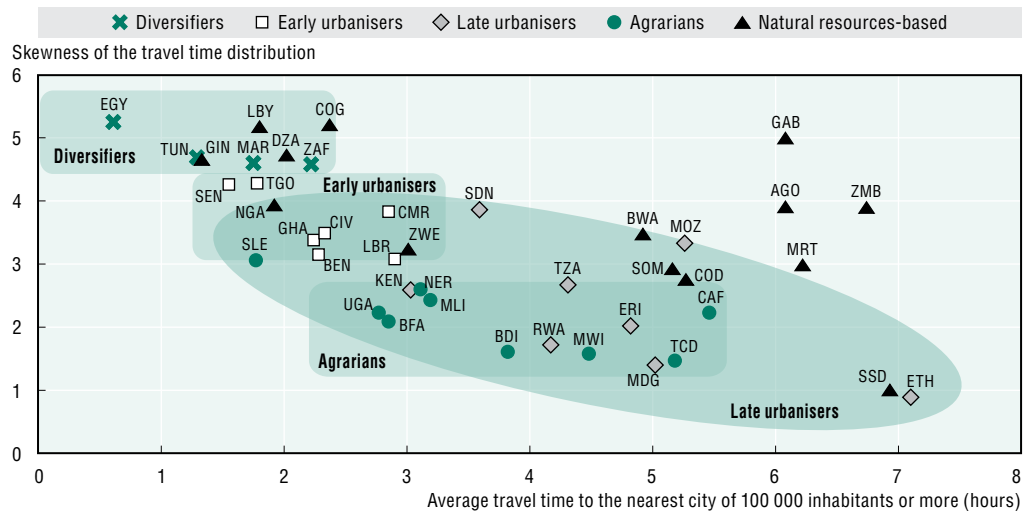
Inter-city transportation holds the key to spatially inclusive urban development (AfDB/OECD/UNDP, 2015). In a study of 15 African countries whose primate city is a port, Storeygard (2013) finds that reducing transport costs by 1% can raise growth in the hinterland city by 0.2%. The effects differ depending on the surface of roads: cities connected to the port by paved roads are chiefly affected by transport costs to the port, while cities connected to the port by unpaved roads are more affected by connections to secondary centres. This suggests that firms in cities not connected to the port may rely more on their rural hinterland and intermediate cities for trade.

Each group of African countries exhibits a different pattern of road networks and connectivity. The accessibility of the road network can be characterised by the distribution of average per-person travel time to the nearest settlement with more than 50 000 people and the skewness of this distribution (Figure 7.13).

- The *diversifier* countries have moderately aggregated populations where 90% of the population live on 20-40% of the land surface. Their more developed networks of cities and good transportation leave a small proportion of the population in inaccessible areas as shown by the low average travel time and high skewness level.
- The transportation network in *early urbaniser* countries slightly lags behind the *diversifiers* as manifested by their lower average and more skewed distribution of travel time to the closest towns of 50 000 inhabitants. They often have a more uniform distribution of the population than countries in other groups. This results from a fairly even distribution of rain-fed areas and a more frequent expansion of agricultural land due to farming crops such as cacao and cotton which lead to spreading out the population.
- *Late urbanisers* and *agrarian* countries have the least developed road networks. Average travel times to the nearest towns and cities are high, at three hours or more, and a large share of the population is located in remote, inaccessible areas.

Governments can increase connectivity between cities and deepen regional integration through development corridors. Corridors link different cities and regional markets through transport, fostering trade exchanges while providing positive externalities to local populations. In a regional context, an urban corridor becomes a line of economic integration. Unlike the colonial **import/export corridors** connecting landlocked countries to the coast which contribute relatively less to intra-regional and inter-cities trade, **development corridors** connect cities of different countries among themselves and with regional trade markets, following coastal, trans-Saharan or trans-Saharan directions (see Table 7.3).

Figure 7.13. Average travel time to nearest urban areas and skewness of the distribution in Africa, 2010



Note: The x-axis represents the average per-person travel time to the nearest settlement with more than 50 000 people and the Y-axis is the skewness (measuring the asymmetry of the probability distribution) of the average per-person travel time. A lower skewness level in this case implies a longer right tail of the distribution, which means more people in the country reside in the remote, inaccessible areas.

Source: Linard et al. (2012).

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Table 7.3. Main corridors in Africa

Corridor	Passing by	Length
Cairo-Dakar	Cairo – Tripoli – Tunis – Algiers – Rabat – Nouakchott – Dakar	8 636 km
Algiers-Lagos	Algiers – Tamanrasset – Agadez – Tamanrasset – Kano – Lagos	4 504 km
Tripoli-Cape Town	Tripoli – N'Djamena – Kinshasa – Windhoek – Cape Town	10 808 km
Cairo-Cape Town	Cairo – Khartoum – Addis Ababa – Nairobi – Dodoma – Lusaka – Gaborone – Cape Town	10 228 km
Dakar-N'Djamena	Dakar – Bamako – Ouagadougou – Niamey – Kano – N'Djamena	4 496 km
N'Djamena-Djibouti	N'Djamena – Djibouti	4 219 km
Dakar-Lagos	Dakar – Banjul – Bissau – Conakry – Free Town – Monrovia – Abidjan – Accra – Lomé – Cotonou – Lagos	4 010 km
Lagos-Mombasa	Lagos – Yaoundé – Bangui – Kisangani – Kampala-Nairobi – Mombasa	6 259 km
Lobito-Beira	Lobito – Lubumbashi – Lusaka – Harare	3 523 km

Box 7.4. Urban corridors contribute to West Africa's structural transformation

The case of the Abidjan Lagos Highway Corridor (ALHC) illustrates the contribution of urban corridors to West Africa's structural transformation. The ALHC links Abidjan (Côte d'Ivoire) to Lagos (Nigeria), passing through Accra (Ghana), Lomé (Togo) and Cotonou (Benin), connecting functional, urban economic areas and building on economic interdependency. This line concentrates 70% of West Africa's regional economy. It is designed to promote the integration of these five national markets and help overcome the size limitations of several of them. Urban corridors provide local populations with simultaneous access to several types of infrastructure and services, such as highways, electricity, water and ICT connections. Connecting the Lagos-Abidjan-Dakar and Tanger-Rabat corridors would open opportunities for accelerating economic expansion from West Africa towards North Africa. Financing a highway between Senegal and Mauritania will complete the South-South co-operation between the Arab Maghreb Union countries and the Economic Community of West African States (ECOWAS). The African Development Bank finances urban corridors such as the ALHC, reinforcing integration between African cities.

By reducing trade costs, cities specialise in niche functions and complementary products. Improved transport and communication can expand the market catchment for firms. Better transportation between cities reduces the transaction cost of sourcing intermediate inputs from specialised cities within a chain. Network analysis of non-resource FDI in African cities reveals that cities can, but do not necessarily, compete with other cities from the same region. More specialised cities tend to attract more FDI, because foreign investors find it more difficult to substitute a specialised city with competitive advantages in a given sector by another investment destination. Reducing trade costs can also strengthen certain cities' positions as "broker gates" of investment in other cities: Johannesburg is the primary broker of all flows into Africa, followed by Nairobi, Lagos and Cairo. These cities offer stock exchanges and infrastructure that can facilitate financial flows into the surrounding regions (Wall, 2016; forthcoming).

Facilitating safe housing is key for urban development

Cities can improve housing conditions, particularly in informal settlements or slums, to ensure more inclusive development (see Chapter 6).⁴ Numerous practices of slum upgrading in Africa show that place-based and comprehensive packages of sectoral reforms, financing, job creation, urban governance and empowerment of community groups can overcome the interlinked challenges of informal settlements and vulnerable jobs.

- South Africa's free stand-alone housing programme has shown that access to affordable housing can alleviate house chores for women, reduce household poverty and increase female participation in the labour force (Franklin, 2015b). Increased tenure security has positively increased housing investment in many countries.
- In Nairobi, improved tenure security and basic infrastructure at home creates an "enabling" environment for slum dwellers to pursue entrepreneurial activities which can provide additional income and diversify household livelihoods (Gulyani and Talukdar, 2008).
- On the downside, certain slum upgrading programmes may also have often excluded tenants, subtenants and newly-established occupants who tend to be the most vulnerable. In Nairobi, certain programmes targeting housing inside slums have led to higher property values captured by structure owners rather than aiding low-income tenants (Gulyani and Talukdar, 2008).

A participative and holistic approach can allow policies to be sufficiently flexible and tailored to the needs and capacity of local populations. Local governments and city authorities can play a key role in planning land use more effectively and in mobilising local resources, while co-ordinating with regional and national authorities. Where rental mode dominates the slum housing supply, the government can facilitate the negotiations between tenants and owners and use infrastructure investment and tenure legitimisation as incentives to explicitly enhance owner occupancy in slums (Gulyani and Talukdar, 2008). Participatory slum upgrading has produced impressive results in several cities, for instance in Dar es Salaam since 2004 (Collin, Sandefur and Zeitlin, 2015).

Morocco's Villes sans bidonvilles programme provides a good example of place-based and participatory slum improvements. Between 2000 and 2010, Morocco ranked second globally in achieving 46% of the objectives in slum improvements under Target 11 of the 7th Millennium Development Goal. By the end of March 2010, 154 000 households benefited from a housing unit, including 62 000 households in the 40 centres already declared slum free. The success of the programme relied on the following:

- 1) actively involving local authorities and holding them accountable through specific contractual frameworks (City Contracts)
- 2) enabling the private sector to supply the majority of housing
- 3) increasing affordable housing stock with a goal of 100 000 social housing units and service land plots annually.

The Villes sans bidonvilles programme aimed to build a consensus among all stakeholders in choosing between three types of interventions: on-site re-housing, relocation and *in situ* upgrading. Innovative financial business models attracted private-sector participation, while targeted subsidies alleviated access to finance constraints for the majority of the poor. The programme was financed 40% through the general budget and a tax of USD 12 per tonne of cement, 30% through beneficiary household contributions and the rest through profits from housing sales to upper-income householders and from international donors.

Similarly, Tunisia's slum upgrading policy decreased the prevalence of slums from 24% of the total housing stock in 1975 to 2% in 1994 (World Bank, 2003). The Agence de Réhabilitation et de Rénovation Urbaine (ARRU) introduced a significant amount of formal housing to the market, alongside construction improvements and an increased rate of infrastructure connection. Between 2007 and 2009, ARRU's rehabilitation programme allocated 70% of its budget to infrastructure and public facilities and 30% to small and micro enterprises (UN-Habitat, 2008).

Social safety nets can lift vulnerable groups out of urban poverty

The recent development of social protection schemes in Africa can be extended to urban areas to also benefit the urban poor. Social protection schemes – be they public or private, formal or informal – are intended to lift individuals out of poverty and protect them from the risks of falling back into poverty. In 2015, 40 African countries provided unconditional cash transfer schemes, twice the number in 2010. Social assistance programmes support 15% of all households in extreme poverty, versus 25% in rural areas. These programmes are evolving to respond better to the demands of the growing urban poor, many of whom are extremely poor (Chapter 6).

Burkina Faso, the DRC, Ethiopia, Mali and Tanzania have recently started implementing what the World Bank refers to as a “first generation” of urban social protection programmes. Their common objective is to alleviate poverty and mitigate inequality, while connecting individuals to services, enhancing human capital and promoting economic activity. Achieving effective coverage remains a challenge, however. General subsidy schemes are generally regressive, whereas the benefit levels and targeting methods require adjusting to the higher cost of living in cities. Individuals' high mobility in informal settlements and income fluctuations make it difficult to target beneficiaries. Administrative fragmentation and poor information flows between national and local entities also impede the effective implementation of social protection schemes.

Box 7.5. South Africa's Expanded Public Work Programme

South Africa's Expanded Public Work Programme (EPWP) shows that social protection programmes can support urban services and promote economic activity. The EPWP was established principally to employ the large numbers of low-skilled workers structurally excluded from the formal economy. They were initially hired to construct and maintain infrastructure in informal urban settlements. The programme has expanded to include social services and environmental work. It creates more than 1 million short-term jobs per year, at a cost to government of approximately ZAR 30 billion (USD 1.8 billion, or 0.8% of GDP). The average duration of an EPWP job is 70 days, and the daily wage is well below the minimum for formal sector employment but (pro rata) above the level of the most generous monthly social grant. The EPWP interacts with other social protection arrangements. Participants are covered by unemployment insurance and workers' compensation benefits. Although such coverage is globally low in South Africa, it is higher in urban areas than in rural areas: 4.3% vs. 1.9%, respectively. Ensuring such coverage may help sustain the gains in welfare that this first generation of urban social protection schemes hopes to achieve. Social insurance mechanisms should also be consistent despite inevitably irregular and small contributions by precarious workers.

Box 7.5. South Africa's Expanded Public Work Programme (cont.)

The EPWP has not made the impact on unemployment that had been expected, however. Its decentralised model – whereby the national government incentivises local administrations to leverage their budgets and employ their own staff – has experienced major challenges in terms of buy-in, reporting and compliance with national guidelines. Moreover, the continuing structural weakness of the formal labour market has caused a high proportion of participants to remain in the programme rather than take up formal employment. However, the innovations piloted by the EPWP, both in terms of programme design and institutional structure, are a benchmark for large-scale programmes elsewhere in Africa and beyond.

Expanding social businesses can help tap the potential of the urban informal economy

African urban dwellers adopt and create new forms of social businesses adapted to their urban realities. Social businesses have long existed in Africa, extending back to traditional systems of mutual support. Unlike traditional businesses, social businesses are not driven by profits but by the mission to provide solutions to social challenges. Nowadays, mutual assistance groups or community enterprises (mainly co-operatives) are widespread in urban areas (Fafchamps and La Ferrara, 2012). Co-operatives offer financial services to underprivileged people. In Kenya, for example, Savings and Credit Cooperative Societies provide alternative to banks for low-income earners. Moreover, the informal economy often relies on digital payment technology. The spread of digital payment systems (e.g. mobile phone-based money transfers such as MPesa in Kenya and Tanzania or Orange Money in Côte d'Ivoire) allows integrating more formal businesses with informal micro-entrepreneurs by providing both greater financial flexibility (working capital, micro-credits, etc.) and more efficient monitoring of transactions. In addition, using digital applications, informal entrepreneurs can manage operations even better by working from a simple smartphone such as Sokotext and Kaymu, which can link urban consumers in informal settlements to local fresh food producers, for instance.

Innovative business models joining formal businesses and informal micro-entrepreneurs are being developed. The Bel Group uses its digital platform Sharing Cities to build on existing networks of street vendors to develop its distribution strategies across Africa. The company partners with many stakeholders, public, private or voluntary, to provide sellers benefits in the form of micro-insurance, micro-credits, vocational training and administrative support to help them formalise their activities. This initiative allows Bel Group to optimise its distribution network while improving the livelihood of sellers and contributing to the gradual formalisation of their businesses (Ménascé, forthcoming).

Social businesses can offer manufacturing and affordable social services. In Agadir (Morocco), more than 7 000 women work in some 150 co-operatives that produce beauty products using oil from the region's argan trees. The 60 women workers receive 100% of the profits, and the co-operative carries out actions to improve living standards in rural and urban Morocco. South Africa's International Centre for Eyecare Education provides eye care products at a price affordable for the poor.

Some African countries are already implementing concrete policies to support the development of social businesses. For example, in 2014, the Malian government adopted the National Policy for the Promotion of the Social Economy and the Action Plan for

2014-2018. The policy includes simplification of the legislation, support to existing social enterprises networks and better access to credit for social enterprises. South Africa's New Growth Path framework of 2011 explicitly recognised the role of the social economy in creating sustainable jobs while the Preferential Procurement Regulations reaffirmed that engagement with disadvantaged South Africans was a key criterion for winning public sector procurement (Littlewood and Holt, 2015). Common strategies to help develop social businesses across Africa and on other continents include these:

- promote appropriate legal frameworks that simplify the institutionalisation of informal initiatives (e.g. allow co-operatives to operate in different sectors)
- facilitate access to finance for social businesses
- provide financial support directly to social businesses based on their needs
- increase awareness about social entrepreneurship through training programmes, research and communication strategies
- support existing networks that promote social entrepreneurship and foster their development.

Holistic and integrated strategies can promote urban security

The multi-faceted nature of violence and crime requires an integrated and holistic strategy. The Lagos State Security Trust Fund launched in 2007 has managed to reduce the levels of insecurity and perceptions of crime problems (UNODC, 2011: 19). The initiative aims for broader community response by fostering effective and enduring public-private partnerships at all stages. Its multi-faceted strategies have included job creation, improved social services, redevelopment of public spaces and the building of a culture of prevention rather than repression. Similarly, the Safer Cities Programme by UN-Habitat combines crime prevention, the establishment of ward tribunals, neighbourhood watch initiatives, employment creation and skills training for youth, and safety audits for women.

Urban projects successfully providing public goods and safety highlight the importance of community involvement. Municipal actors and local communities such as neighbourhood watch organisations, women's associations and religious organisations are influential in urban Africa (Kilcullen, Mills and Trott, 2015). Women's safety audits have been experimented in Durban, Dar es Salaam, Nairobi and Abidjan. They have permitted women to identify safe spaces and make recommendations based on lighting, signage, isolation, movement predictors, maintenance and overall design. In Lagos, the Makoko floating school project relied on community involvement. The Lagos State Ministry of Physical Planning and Urban Development is incorporating the school into a regeneration plan for the entire Makoko slum.

Tailored policies responding to the specificities of local contexts through multi-partnerships can prove efficient. In the Western Cape province, the Community Safety Improvement Partnership programme has organised Policing Needs and Priorities meetings in 150 police stations to define local priorities and needs. The Chrysalis Youth Development Programme trained more than 1 450 young people in the safety and security sectors between 2012 and 2015 (ISS, 2015). These programmes reveal extensive interaction between the public and private sectors within the public security sphere (Abrahamsen and Williams, 2008: 547).

Africa's urbanisation can contribute to environmental development

Urban areas can facilitate the efficient use of environmental resources through sharing land, other natural resources, goods and services. For example, cities endowed with efficient mass transportation systems reduce per capita pollution more substantially than less densely populated places that rely on individual motorised transportation (Glaeser, 2012). Moreover, sustainable cities show potential for shifting to greener methods of production, because they bring larger economies of scale: “urban green growth is fostering economic growth and development through urban activities that reduce environmental impact, for example low air pollution and CO₂ emissions; low consumption of natural resources including water, energy and undeveloped land; and the protection of ecological services” (OECD, 2013b: 9).

Tackling urban environmental challenges is strategic for Africa's sustainable development. The stakes may be even higher for Africa than for other world regions (see Chapters 4 and 6).

- Because it is still urbanising, Africa can reap huge benefits by leap-frogging to a green economy. For instance, two-thirds of urban investments are to be made between now and 2050. Making investments in “no regret” urban infrastructure and planning urban development are necessary. Today's technologies provide additional momentum for a new ecological model of service delivery in African urban areas, thus shaping more sustainable cities (Cartwright, 2015).
- The costs of environmental degradation are high in Africa given the continent's levels of human development (see Chapter 6; Roy, forthcoming). Ignoring the already high costs of air pollution – in terms of both public health and economic cost – will act as a binding constraint on sustainable development. The environmental impact of local urban development goes beyond administrative boundaries to reach peri-urban and rural areas. Further, Africa is more vulnerable to climate change than other world regions, although it does not contribute much to this global challenge.

Urbanisation is an opportunity to address climate change more efficiently by developing more sustainable cities. Urbanisation gives governments the chance to use and manage natural resources more sustainably, to sustainably manage waste, to create green jobs for the low-skilled population, to improve public health through better access to safe water and sanitation, and to minimise the rising costs of air pollution.

Policy makers can play an important role in making structural transformation more sustainable. Table 7.4 presents some examples of activities in various urban sectors that can reduce their environmental impact.

Table 7.4. Urban activities that can reduce cities' environmental impact

Sector	Activities
Land-use planning	Zoning that allows for a mix of land uses so as to reduce travel distances between home, work and other activities Tax reform to encourage the development of underused lands in urban cores and to discourage urbanisation of underdeveloped land on the urban fringe
Transport	Expansion of and/or improvements to public transport Physical improvements to encourage walking and cycling Fees for personal vehicle travel (e.g. congestion charges)
Buildings	Retrofitting of existing building stock to increase energy efficiency Minimum energy efficiency standards for new buildings
Energy	Installation of distributed renewable energy generation (e.g. solar panels) District heating and cooling systems Fees that discourage peak energy use
Waste	Recycling of household and industrial waste Waste-to-energy and landfill methane-to-energy systems Fees that discourage waste generation
Water	Fees that encourage water conservation Governance mechanisms to improve efficiency of water delivery

Source: OECD (2013b).

Where city-level data is scarce, material flow analysis and data scaling from national to city levels can be used to identify different types of African cities according to their energy consumption, as depicted in Table 7.5. This approach can inform the growth of cities and the management of resource consumption through better energy efficiency, material cycling, waste management and more sustainable infrastructure in urban systems. A sustainable urban metabolism can be defined as an urban system restoring biodiversity, reducing carbon emissions to a minimum of two tonnes of CO₂ per capita and improving resources efficiency, so that on average city dwellers consume approximately eight tonnes per capita (Swilling, 2015: 4). Resource consumption by cities is a result as well as a driver of the urban economy. Accounting for urban consumption of resources, identifying the mechanisms behind their mobilisation, and measuring the intensity and efficiency of urban consumption patterns can help better understand the potential for urban resource efficiency and sustainability.

Table 7.5. Classification of African cities based on socio-metabolic transition

Group 1 Resource-poor cities	Low consumption of all materials except biomass and water. This suggests limited industry and low income and that the city is growing fast.	Kinshasa, Kigali, Antananarivo, Lagos, Ouagadougou, Niamey, Port Harcourt, Bujumbura, Bangui, N'Djamena and Addis Ababa
Group 2 Cities in transition	Medium consumption of biomass, water, electricity, construction materials and fossil fuels.	Pointe-Noire, Luanda, Kampala, Douala, Libreville, Mombasa, Nairobi, Harare, Lusaka, Maputo, Dar es Salaam, Abidjan, Accra and Kumasi
Group 3 Resource-sufficient cities	Medium or high consumption of biomass, electricity, fossil fuels and construction materials.	Algiers, Constantine, Alexandria, Cairo, Casablanca, Cape Town, Johannesburg, Malabo, Tunis, Marrakesh and Durban

Source: Swilling (2015).

Renewable energy can help fill the energy gap

Investment in green energy can help solve Africa's challenge of synchronising economic and environmental development. It would relieve firms of their energy constraints while avoiding repeating other regions' experiences of rising household and ambient air pollution.

Increasing access to electricity is a chance to invest in renewable resources

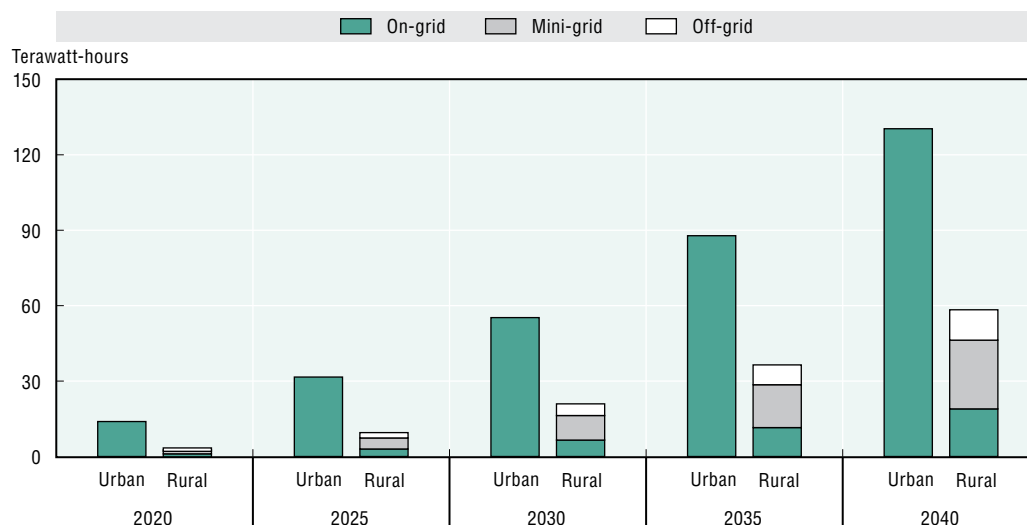
Tackling the energy challenge, especially in urban areas, can improve the performance of African firms. Inadequate or unreliable access to electricity remains one of the biggest binding constraints on economic development:

- Power outages are considered one of the biggest obstacles faced by firms. In sub-Saharan Africa, 49% of small and medium-sized enterprises consider electricity as a major constraint. The manufacturing sector experiences power outage 56 days per year on average. Investing in generators costs three times the price of purchasing electricity from the public grid.
- Unreliable electricity is one of the main reasons preventing firms from growing bigger. In the informal sector, power outages cause up to 16% loss of sales revenues compared to 6% in the formal sector. Outages also discourage start-ups as they lack capital to invest in generators.
- Lack of access to electricity also leads banks to decline loans because it increases firms' economic risks.

Bridging the energy gap is easier in urban areas than in rural ones. In its *Africa Energy Outlook*, the International Energy Agency (IEA) has developed a "central scenario" to meet Africa's electricity demand. In that scenario, two-thirds of the population gaining access would live in urban areas and be connected to a main grid. Figure 7.14 shows that this increase in electricity access would add around 190 terawatt-hours (TWh) to total


power consumption in 2040, mainly through urban on-grid access. Currently, around two-thirds of sub-Saharan Africa's population, or 635 million people, do not have access to electricity. Over a third of the area's urban population lacks access to electricity, compared to less than 5% in developing Asia or Latin America. Sub-Saharan Africa's electricity demand per capita averages 400 kWh, 75% below developing Asia and less than the electricity needed to power one 50-watt light bulb continuously for a year.

Figure 7.14. Projected electricity demand from the sub-Saharan African population gaining access to electricity, 2020-40



Note: These projections correspond to the "New Policies Scenario" of the IEA (2014).

Source: IEA (2014).

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The IEA estimates that **increasing the electrification rate in sub-Saharan Africa from around 30% today to 70% in 2040 would cost USD 205 billion in capital investment.** This sum is less than one-fifth of total power sector investment in the region. Achieving this level of investment requires steadily improving the investment conditions for electricity access-related projects, while rapidly improving capacity and effective co-ordination among the various actors involved. Clarity and consultation over the pace of grid extension allows the stakeholders, including local communities, to make an informed assessment of the best options for expanding access. Donor programmes likewise need to be managed carefully, both to ensure that the beneficiaries are fully involved from the outset, not least to guarantee adequate and on-going maintenance, and to avoid undercutting fledgling commercial energy providers.

Renewable energy sources in Africa are mainly wind and solar (IRENA, 2015), though hydropower and geothermal sources also show potential to supply sustainable cities with renewable energy.

- Africa could potentially generate 460 petawatt hours (PWh) annually through wind energy. Wind energy is currently the lowest cost source of electricity available and generated a 2 462-megawatt (MW) capacity at the end of 2014. Installed wind power capacity in Africa is likely to rise to 75-86 gigawatts (GW) by 2030 (GWEC, 2014). Morocco has the largest wind network. South Africa's Cookhouse wind farm is the continent's largest, with 66 turbines generating 138 MW of clean power.

- For solar energy, Africa has the potential to generate 1 130 PWh per year through photovoltaic and concentrated solar power technology. Africa's cumulative installed capacity in 2014 was 1 334 MW, with South Africa leading the growth. In poorer countries such as Mali, more than 7 926 solar photovoltaic home systems and 500 institutional systems have been built.
- Other sources of renewable energy also show great potential. Hydropower plant projects with a combined new capacity of 17 GW are under construction on the continent. The Grand Inga project on the Congo River envisages the installation of 40 GW of hydro-generating capacity. Africa has installed 606 MW of geothermal capacity, of which 579 MW in Kenya. For biofuel sources, the potential is substantial especially in the countries along the Equator, yet their capacity will have to balance with concerns of food security and demographic growth.

Each African country needs tailored policies for renewable energy that tap its own potential. Countries can also benefit from connecting to regional power pools to diversify and share the generation capacity through deeper regional integration, better interconnection and information exchange. Table 7.6 shows illustrations of sustainable energy projects in Cape Town.

Table 7.6. Sustainable energy projects in Cape Town, South Africa

Project, location and timeframe	Stakeholders	Development outcome of the project
Western Cape Industrial Symbiosis Programme, launched in 2013	Funded by Western Cape Government Department of Economic Development and Tourism, delivered by GreenCape.	The Green Economy initiatives of the Western Cape Government connect local industries using each other's by-products. Impact estimates (2013/14) show an additional ZAR 2.1 million in sales, ZAR 100 000 in private investments, cost savings of ZAR 1.5 million, 23 tonnes of landfill diversion and savings of 1 820 megawatt hours (MWh) per year in energy.
IShak, 1994-2010	Initial funding by the South African government's Green Fund providing ZAR 17 million. Initiated by the Sustainability Institute Innovation Lab.	This community-based infrastructure initiative around solar electricity utility serves at least 1 500 end users. Residents living in the Enkanini informal settlement (in Stellenbosch) are offered electricity service on a commercial but subsidised basis. Revenues from fees plus a free basic electricity subsidy cover long-term running costs of the service.

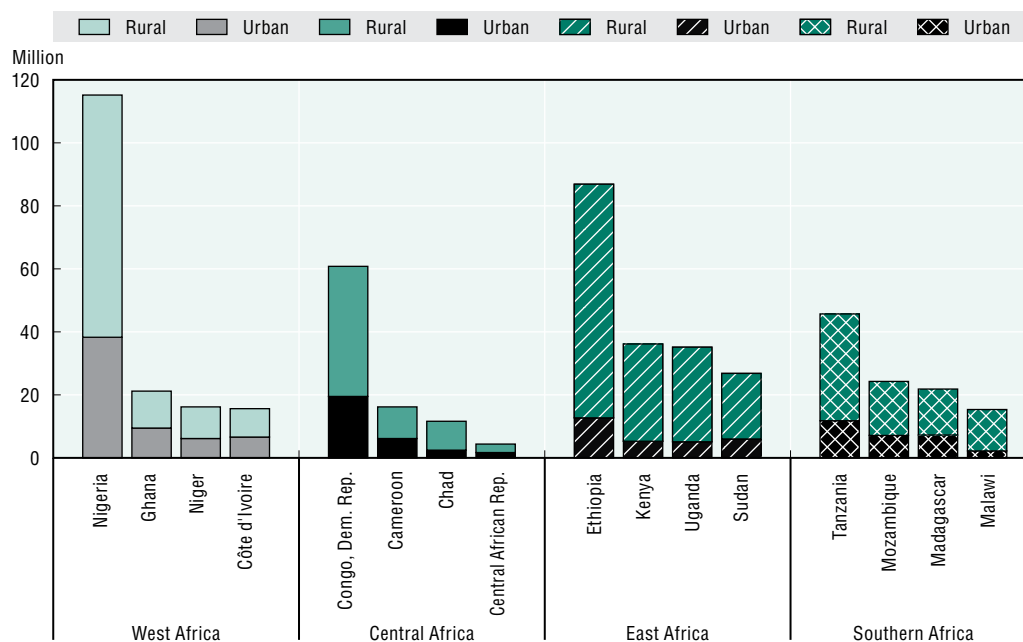
Source: AEO experts' survey, 2016; Cartwright (2015).

By combining policies that target renewable energy and small manufacturing firms, African countries can stimulate private employment creation. Renewable energy uses up to ten times the labour intensity of traditional energy (Cartwright, 2015). In addition, smaller firms and particularly manufacturing ones show the highest annual employment growth. Africa could use a wide range of technologies to avoid lock-in to unsustainable and inefficient types of energy. For example, mobile phone data can be used for electrification planning, allowing local governments to provide electricity to areas with scarce information on energy consumption.

Targeted policies can increase access to clean cooking, particularly in urban areas

Household air pollution, mostly stemming from the traditional use of solid biomass for cooking, costs Africa USD 232 billion in premature death tolls in 2013 (Roy, forthcoming). Some 755 million people in sub-Saharan Africa, 200 million of whom live in urban areas, rely on fuelwood and charcoal for cooking, typically with inefficient stoves in poorly ventilated spaces. Even when people have access to modern fuels in cities, such as liquefied petroleum gas (LPG), natural gas, biogas or electricity, they may also continue to use solid biomass, a phenomenon known as "fuel stacking". Within urban areas, charcoal is a popular fuel choice as it offers higher energy content per weight than wood, making it easier to transport, store and distribute. Policies and effective regulation of the charcoal market will increase the share of more efficient kilns. Figure 7.15 shows the urban and rural populations who rely on solid biomass for cooking.

Figure 7.15. African populations relying on solid biomass for cooking, 2012



Source: IEA (2014).

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In the *Africa Energy Outlook's* “central scenario”, the investments for access to clean cooking in sub-Saharan Africa will reach USD 9.5 billion over the period to 2040. These investments are largely made in urban areas where households mainly switch to LPG. Policies play a major role in households' decisions to spend a portion of their incremental income on cleaner cooking facilities, which they generally would not consider. Among the regional initiatives in place, ECOWAS initiated a programme in 2012 called the *West African Clean Cooking Alliance*. It aims to ensure that by 2030 the entire ECOWAS population has access to modern cooking fuels and devices. Kenya has plans to eliminate kerosene use in households by 2022 and has a relatively developed market for improved biomass cook stoves in urban areas. In Senegal, incentives have supported LPG use, and less than 25% of the urban population now uses solid biomass.

Multisectoral and co-ordinated policies can mitigate the rising cost of air pollution

Removing coal and petroleum subsidies could create large welfare gains. Phasing out energy subsidies would account for more than a 50% welfare gain in Africa and at least a 50% reduction in deaths from air pollution (Coady et al., 2015: Figure 12). Furthermore, Africa's *diversifier* countries may consider implementing transport-related mitigation measures already tested in OECD countries, such as road-user pricing or subsidies for company-car usage, and adapt them to the local context (Harding, 2014; Roy, 2014).

Low oil prices provide an opportunity for African countries to gradually phase out costly fossil fuel subsidies. Fossil fuels cost African governments 5.5% of GDP in 2015, including 1.8% of GDP to cover the difference between the final energy price and the actual cost of fossil fuels. However, a gradual approach may be desirable, given the size of the required price increases and uncertainty about the optimum level of taxes. A slow increase would allow time for households and firms to adjust and for governments to further refine estimates and implement measures to protect the poor. The funds

released from phasing out the subsidies can be used for targeted social protection to ensure the welfare of those most affected by a price hike.

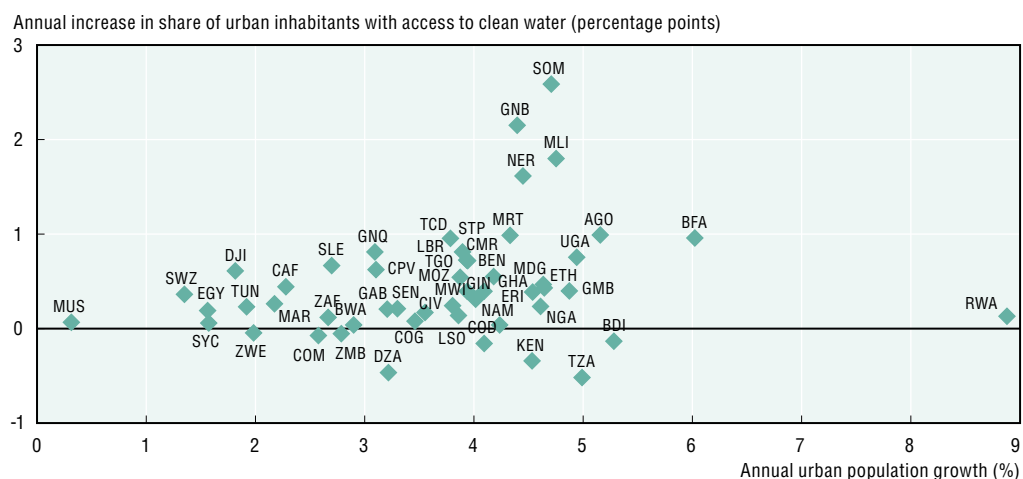
The need to mitigate Africa's main environmental risks is obvious. Household air pollution (HAP) is Africa's most significant environmental problem, followed by unsafe water and unsafe sanitation. Opportunities lie in comprehensive programmes of public investment in urban improvements, simultaneously tackling these problems, along with APMP as part of a comprehensive urban policy agenda. The cost for Africa of these four environmental risk factors was USD 850 billion in 2013 and is heading towards USD 1 trillion in the near future. A cost-benefit analysis must be performed and peer-to-peer learning applied in regard to "old-style" environmental problems, such as unsafe water and household air pollution, which advanced and emerging economies have largely eliminated. But new environmental risks, such as APMP, should not be ignored because their costs are rising (see Chapter 6).

The world has an interest in helping Africa reduce its air pollution. "Local" air pollution is also a transnational and indeed a global problem that requires international co-ordination. For example, black carbon is an important greenhouse pollutant; it is a product of open wood fires and of "the exhaust pipes of unsophisticated diesel vehicles" (Roy, forthcoming). As Africa's population will increase to approximately 40% of the world's population in 2100, its air pollution could significantly contribute to climate change.


Better access to safe water and sanitation in urban areas significantly improves public health

232 million more urban residents in Africa have access to improved water in 2014 than in 1990, and 128 million urban residents more have gained access to sanitation over the same period. Countries that have made the most significant progress are those starting from a lower base such as Guinea-Bissau, Mali, and Niger where less than two-thirds of the urban population had access to water in 1990. By 2015, these countries have increased the share by at least 40 percentage points. Other countries are catching up albeit at slower pace. Angola, Cabo Verde, Central African Republic, Mauritania, and Tanzania have successfully increased the rates of urban access to improved sanitation by more than 20 percentage points during this period. In contrast, urban access to water, sanitation and hygiene (WASH) services delivery has deteriorated in several countries during the same period as in Algeria, the DRC and Sudan.

Figure 7.16. Access to improved water in urban areas and urban population growth in Africa, 1990-2015



Source: WHO (2014); UN DESA (2014).

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Policies in several countries have successfully increased urban access to improved water and sanitation despite strong urban population growth. In Mali, the share of population with access to improved water has increased from 53% in 1990 to 97% in 2015 even if the urban population has increased by 5% a year during the same period (Figure 7.16). The combination of decentralisation and public-private partnerships has enabled the urban water service sector to operate more efficiently than other utilities in West Africa (USAID, 2010a). Water service management is decentralised to about 700 administrative districts or communal councils, while a semi-private firm, *Energie du Mali SA*, holds concessional contracts to provide service and expand coverage to 16 urban areas including Bamako.

Box 7.6. Decentralisation for improved water supply and sanitation performance in Angola

In Angola, infrastructure investments in the water supply and sanitation sector as well as decentralisation of service delivery have significantly transformed the sector. Service delivery was decentralised to autonomous or commercial provincial water and sanitation utilities with technical assistance from the central government. As a result, between 1990 and 2015 urban access to an “improved water source” increased from 52% to 75%, and urban access to improved sanitation increased from 65% to 89%.

Source: USAID (2010b).

Good management of urban wetlands leads to flood control, storage and purification of water and preserves biodiversity

Urban expansion requires sustainable management of ecosystems surrounding urban areas, and the case of wetlands shows their value is often ignored. The International Water Management Institute estimates total value of wetland services in Africa at USD 25 billion a year (McCartney et al., 2010). While significant, this is far less than the USD 70 billion for Asia, showing potential for greater returns. Wetlands and mangrove forests buffer coastlines against storms, ocean surges and sea-level rises, serve as spawning grounds for fish, and allow for activities such as beekeeping, carbon sequestration, fisheries, aquaculture, fuelwood harvesting, ecotourism, research and education.⁵ Table 7.7 shows a variety of ecosystem services from wetlands with African case studies.

Table 7.7. Typology of ecosystem services from wetlands

Services	Ecosystem service	Example
Supporting	Nutrient cycling	The swamps of Kampala's Lutembe Bay filter silt, sediment and excess nutrients from surface run-off, sewage and industrial waste.
	Biodiversity	Zambia wetlands support over 400 bird species and 120 fish.
	Primary production	Photosynthesis takes place in aquatic plants and wetland vegetation.
	Recharging aquifers	Standing wetlands are a key resource for water cycles.
Provisioning	Capture of species	Urban and peri-urban fishing includes fish from freshwaters. The African inland catch exceeds 2.5 million tonnes per year.
	Collection of plant foods	Palm species are collected for food in the Okavango Delta.
	Collection of materials	Papyrus is harvested to make mats and baskets in Uganda.
	Livestock grazing	Over a million goats graze the Inner Delta of the Niger River.
	Crop growing	Rich peat soils support productive agriculture.
	Energy source	Papyrus is compacted into fuel briquettes in Rwanda.
	Timber from wetland forests	Fuelwood and building timber is also collected from mangroves and riparian forests.
	Medicines	Freshwater plant species are used as medicine in Tanzania.
	Freshwater resources	Many African cities draw their drinking water from nearby wetlands, rivers and lakes.
Regulating	Flooding	Wetlands absorb floodwater.
	Storm protection	Mangroves and coastal forests help to buffer cities against storms and ocean surges.

Table 7.7. Typology of ecosystem services from wetlands (cont.)

Services	Ecosystem service	Example
	Carbon sequestration	Wetlands and particularly peatlands are major carbon stores.
	Climate stabilisation	Evaporation from major lakes helps to reduce climatic extremes and stabilise temperatures.
	Water purification	Wetlands help to neutralise various pollutants entering the water system from cities and agriculture.
Cultural	Recreational	Wetlands can be a tourist attraction. The Okavango Delta brings 120 000 tourists a year, creating jobs for 600 guides.
	Spiritual	Many wetlands have local sacred values; Lake Fundudzi in South Africa is believed to be the home of ancestral spirits.

Source: Prepared by the WWF for this edition of the *African Economic Outlook*.

Unplanned urban expansion can endanger wetlands' ecosystems. When wetlands are degraded or destroyed, the associated ecosystem services are lost, for instance in the Sierra Leone River estuary and Haramous-Loyada in Djibouti. Urban expansion around Lagos, Nigeria, caused losses of wetlands in four local government areas of 38-100% between 1986 and 2006 (Adelekan, 2009). Map 7.4 highlights the four cities which are likely to see their urban expansion taking place on the watersheds that supply them with fresh water, possibly reducing their water provisions.

But planned management can help to reverse losses. Fish catch from Lake Malawi tripled after part of the lake was protected and stocks were allowed time to recover (Drill, 2008).

Waste management is an opportunity for sustainable development

Waste management can generate valuable resources and be a source of energy and jobs for more sustainable cities. Recycling can limit the demand for virgin material and products from extractive industries. Waste, methane collected from landfills and bio digesters can produce heat, electricity and other sources of energy. Landfill gas projects can reduce methane emissions from municipal solid waste landfills by capturing 60-90% of carbon emissions (Agbelie, Bawakyillenuo and Lemaire, 2015). In Kampala, where 40% of the residents have their waste collected, community involvement in solid-waste collection and recycling has prevented drain blockages, flooding and contamination of Lake Victoria (Cartwright, 2015: 22). Table 7.8 provides illustrations of projects led by different types of stakeholders in selected African countries.

Table 7.8. Sustainable waste management projects in Africa

Project, location and timeframe	Stakeholders	Development outcome
Recycling factories , 2008-present. Viana (Luanda) and Lobito (Benguela), Angola	Moncartel/Neuerth Group	The Portuguese group Moncartel constructs recycling factories for glass, plastic and engine oils. Neuerth Group invested USD 20 million in a scrap steel recycling plant with the capacity of producing 1 200 tonnes of aluminium bars per month.
Zabaleen Waste Collection , Cairo, Egypt	Zabaleen Community	65 000 <i>Zabaleen</i> waste collectors pick up about 9 000 of Cairo's 15 000 tonnes of daily household rubbish. Up to 80% is recycled.
Solid Waste Recycling , Mauritius	Mauritius' Solid Waste Recycling Company Ltd.	The company produces 20 000 tonnes of compost per year out of municipal solid waste; this has enhanced agricultural productivity and replaced imports of chemical fertilisers for agriculture.
Reliance Compost , launched in 1998. Cape Town, South Africa	Local municipalities	Reliance Compost removes green waste and turns it into organic compost for sale to the agricultural sector. In Cape Town, the company employs 220 people and saves 180 000 tonnes worth of CO ₂ emissions per year. In Western Cape, it has reduced 13 million cubic meters of green waste in land fields since 1998.
AgriProtein , launched in 2014. Cape Town, South Africa	Africa Enterprise Challenge Fund, Stellenbosch University, The Bill and Melinda Gates Foundation, Biocycle initiative	This project consists of using municipal waste as a feedstock in breeding fly larvae, which are sold to livestock and poultry farmers to reduce dependence on fishmeal and scarce fish stocks. The environmental savings from lower fossil fuel consumption, land use and carbon emissions is USD 2 500 for every tonne of MagMeal produced.

Source: AEO experts' survey, 2016; AEO country notes 2016; Cartwright (2015); ILO (2014); Swilling (2015).

Currently sub-Saharan Africa generates about 62 million tonnes of waste per year. The urban lifestyle and urban sprawl increase the costs of waste disposal (Cartwright, 2015). Bio-waste from vegetables and other biological products still make up the majority of Africa's waste, at 50-80% (Okot-Okumu, 2012). A global trend in the increase in electrical and electronic goods points towards a change in waste composition and more plastic and e-waste in Africa's cities. Africa has the lowest waste collection rate, below 50% on average compared to OECD countries' rates largely over 90% (World Bank, 2012). In Egypt, collection rates lie at only 40% of total municipal solid waste, recycling at 2.5% and unsound disposal at 83.5% (D-Waste, 2016).

Reforming the waste collection system allows for financial savings. In Dar es Salaam, the collection rate of solid waste production is only 37%, however the municipality's waste collection operating costs approach 50% of the overall municipal budget (World Bank, 2012). While most African cities spend 20-50% of their annual budget on solid waste management, only 20-80% of the waste is collected (MSO, 2013). The legislation for different waste streams is often fragmented and low collection coverages suggest inefficiency in waste management (UNECA, 2012).

In the long run, African sustainable cities can develop a zero waste approach adapted to the local context. The zero waste approach could eventually achieve 100% recycling through better waste management (Zero Waste Europe, 2014). In 2001, the Polokwane Declaration on Waste Management developed a zero waste plan for South Africa by 2022 (Mohee and Simelane, 2015). A zero waste city requires combining social, political, economic and technical interventions in targeted urban areas that complement one another. Options for policy makers include user-pays waste charges, the demarcation of space for recycling, bio-digesters, upcycling and composting.

Annex 7.A1. Methodology for mapping financial flows to African cities

Today highly dense global and regional networks of foreign direct investment (FDI) have emerged, tying cities together worldwide (Wall et al., 2011; Wall and van der Knaap, 2011). FDI concerns a firm in one country investing in a firm in another country, with the intent of gaining control over its operations. It is made up of two parts: “mergers and acquisitions” and “greenfield investments”. Mergers consolidate particular firms into one, and acquisitions take monetary possession of other firms. Greenfield investments represent investments where parent firms start entirely new projects and facilities in host countries. Greenfield investments relate more directly to the actual development of urban economic activities and are therefore analysed in this chapter, notably for Maps 7.1, 7.2 and 7.3.

The data analysed in this study concern “cross-border” greenfield investments. The data draws from the Financial Times’ database fDi Markets (2016), which is the most complete set of data on international investments between cities and countries. The data concerns global FDI flows to African cities.

- First, the fDi Markets data was verified by testing it against similar data used in the UNCTAD 2015 report, which also partly made use of the same database. The results show very high correlations across a similar panel for the same period (2003-14).
- Next, missing values of fDi Markets data were completed using the Orbis database (Bureau van Dijk, 2016) and online sources. The data was then geocoded with Cartesian co-ordinates for all the origin and destination cities in the Africa dataset. Based on this data, the three maps were generated by means of ArcGIS software.
- To derive the main variables determining FDI to African, Asian and European world regions, we have used data on the volume (count) of greenfield investments and the indicators from the *Global Competitiveness Report 2014-2015* indicators (World Economic Forum, 2015), creating a matching panel of nine years, i.e. 2006 to 2014.
- Out of 24 sub-indicators, we created composite indices for the following 7 categories to calculate each country’s competitiveness index: goods market efficiency, infrastructure, macroeconomic environment, labour market efficiency, technological readiness, market size and health. Each index is adapted to the scale and nature of this study: we selected a set of dimensions and indicators corresponding to factors that contribute to inward greenfield investments in countries. The selection of the indicators is based on theory and the P2 computation. This computation uses a synthetic distance index that combines all indicators into a single value. This allows comparisons between entities (both temporal and spatial) and is considered to be an exhaustive synthetic indicator because it is not based on a reduction of information.
- To calculate the P2 distance (Pérez-Luque et al., 2015; Bonet-García et al., 2015), we started with a matrix X of order (m, n) in which m is the number of spatial units (countries) and n , the number of variables. Each element of this matrix, x_{ri} , is the value of the variable i in the spatial entity r . The P2 distance indicator calculates the distance of each spatial entity with regard to a theoretical spatial entity of reference. Initially, a distance matrix D is calculated as:

$$D_{ri} = |X_{ri} - X^*_{ri}|$$

where x_{ri} is the r -th element of the reference base vector $X^* = (x^*_1, x^*_2, \dots, x^*_n)$. For each variable a reference value must be defined to compare different spatial entities.

- Next, all basic assumptions were tested on the data including multicollinearity, heteroskedasticity, normality and outliers. Because the dependent variable is considered to be count data, we employed the negative binomial model, which is a member of the Poisson estimation family.

Source: Prepared by Ronald Wall and Dorcas Nthoki (2016), Institute for Housing and Urban Studies/Erasmus University Rotterdam on assignment for UN-Habitat, Nairobi for this edition of the *African Economic Outlook*.

Notes

1. Food imports, at USD 86 billion per year on average between 2011 and 2013, represent only a small share of the urban food market (authors' calculations based on UNCTAD, 2014).
2. The middle class is defined here as those with an income of USD 4-20 a day in purchasing power parity (AfDB, 2011).
3. There are multiple definitions of the middle class in developing countries. Some are non-monetary definitions such as aspirations and lifestyle, or asset-based measures. Most definitions set a monetary threshold based on per-person income or consumption using monetary data. They reflect different ideologies, and each has its own limitations in methodology.
4. A slum household is defined as deprived in at least one of the five following amenities: durable housing, sufficient living area, access to improved water, improved sanitation or secure tenure (UN-Habitat, 2006).
5. In Viet Nam a USD 1.1 million investment in community restoration of mangroves saved an estimated USD 7.3 million per year in sea dyke maintenance.

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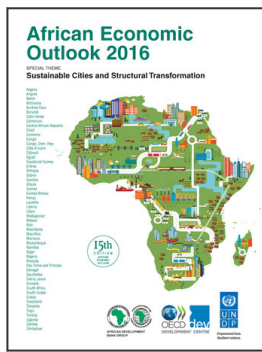
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