African Mobile Observatory 2011

Driving Economic and Social Development through Mobile Services

Contents

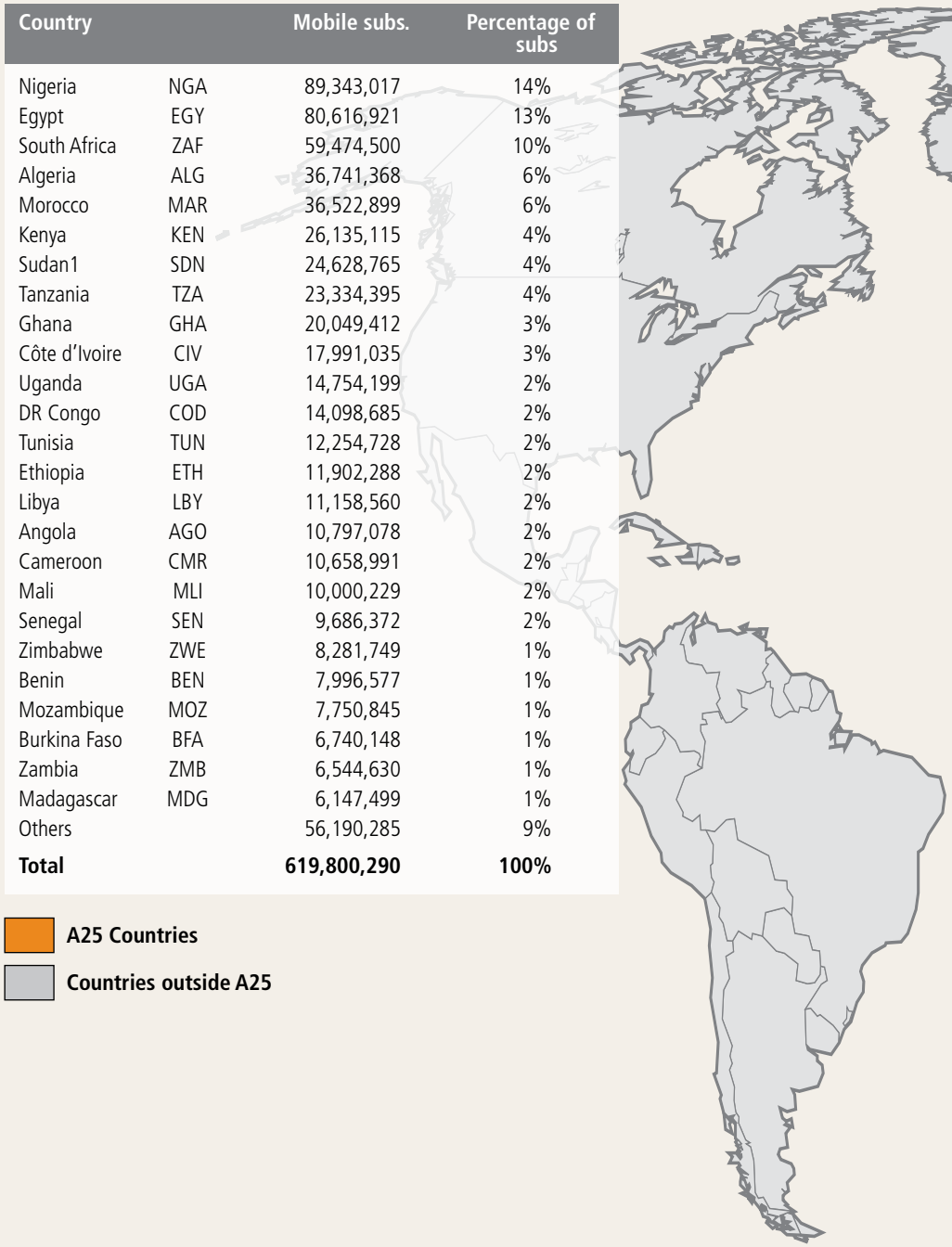
Geographic Scope of this Study

Africa comprises a vast region of 54[1] countries covering 30 million square kilometres and 1.0 billion people. Referring to Africa as one continent would be to overlook the intricacies and complexities of life within a huge diversity of peoples, languages and cultures within and across national boundaries.

It would be impossible to cover all these countries in the detail and thoroughness that they deserve. Therefore within this report we consider the 25 countries which contain 91% of the continent's mobile connections. These markets (hereafter referred to as the A25) are extremely diverse economically, culturally, geographically and politically and are therefore a good representation of Africa as a whole.

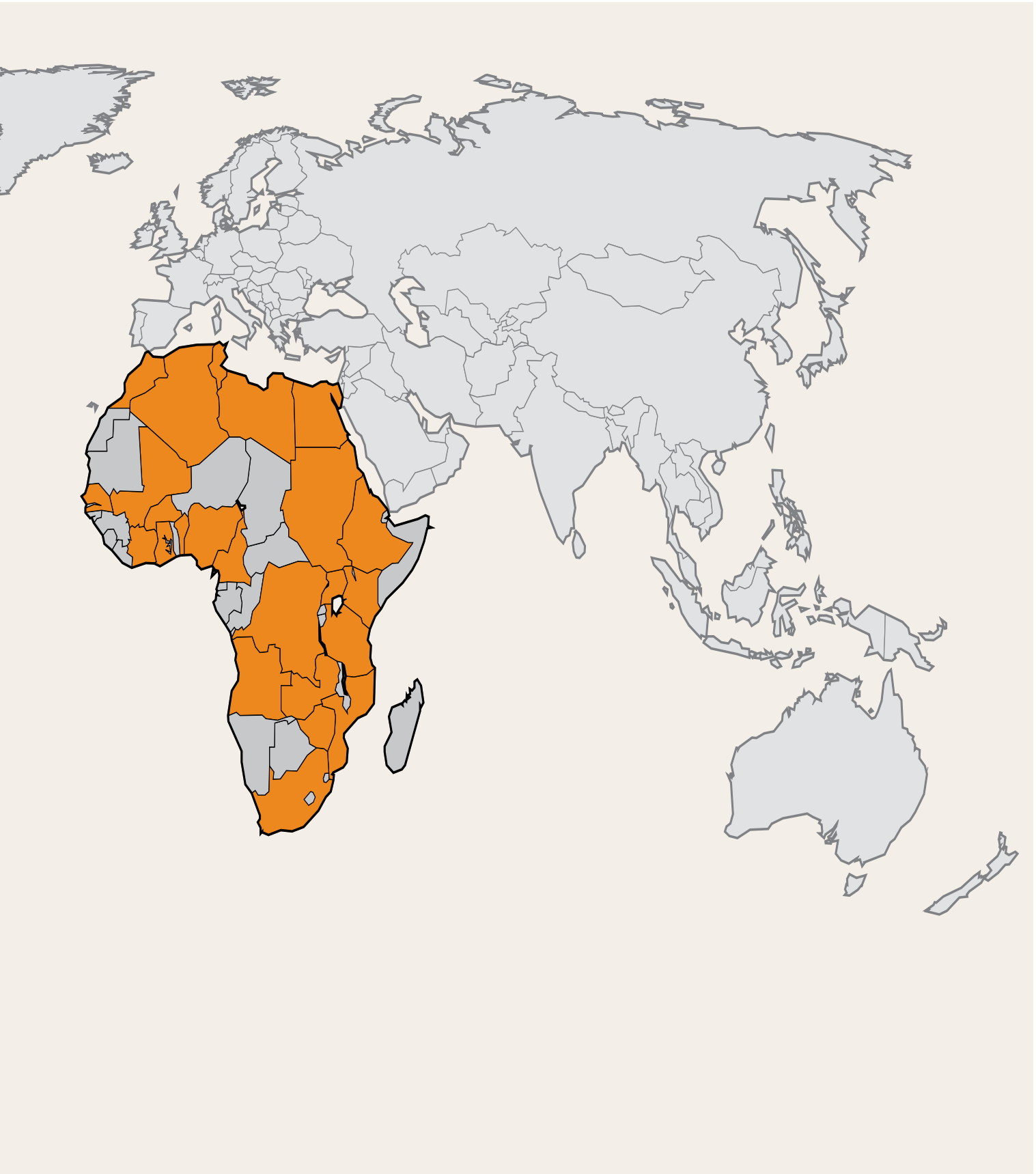
Figure 1: Africa 25 and total mobile connections (2011 YTD)[2]

Country		Mobile subs.	Percentage of subs
Nigeria	NGA	89,343,017	14%
Egypt	EGY	80,616,921	13%
South Africa	ZAF	59,474,500	10%
Algeria	ALG	36,741,368	6%
Morocco	MAR	36,522,899	6%
Kenya	KEN	26,135,115	4%
Sudan1	SDN	24,628,765	4%
Tanzania	TZA	23,334,395	4%
Ghana	GHA	20,049,412	3%
Côte d'Ivoire	CIV	17,991,035	3%
Uganda	UGA	14,754,199	2%
DR Congo	COD	14,098,685	2%
Tunisia	TUN	12,254,728	2%
Ethiopia	ETH	11,902,288	2%
Libya	LBY	11,158,560	2%
Angola	AGO	10,797,078	2%
Cameroon	CMR	10,658,991	2%
Mali	MLI	10,000,229	2%
Senegal	SEN	9,686,372	2%
Zimbabwe	ZWE	8,281,749	1%
Benin	BEN	7,996,577	1%
Mozambique	MOZ	7,750,845	1%
Burkina Faso	BFA	6,740,148	1%
Zambia	ZMB	6,544,630	1%
Madagascar	MDG	6,147,499	1%
Others		56,190,285	9%
Total		**619,800,290**	**100%**



1 The creation of South Sudan in 2011 takes the total number of African states to 54. For the purposes of this report, and due to the historic data available, we have considered both Sudan and South Sudan together

2 Wireless Intelligence, based on active SIM connections as of Q3 2011



1. Introduction

Introduction

The Mobile Observatory series includes reports on the large and mature European market, the extensive and dynamically evolving market of the Asia-Pacific region and the fast growing Latin-American region. These reports underline the industry's commitment to transparency and to engaging with a wide set of stakeholders in planning its future direction.

This is the first African edition in the GSMA Mobile Observatory series. This Observatory provides a comprehensive review of the African mobile communications industry. Included are the latest statistics and market developments, as a reference point for mobile industry participants, policy makers and other interested stakeholders. It covers the state of the industry, including the evolution of competition, innovation in new products, services and technologies and the industry's contribution to social and economic development in Africa.

The report integrates data from a wide range of existing sources to provide a comprehensive picture of the African mobile industry. These include public sources such as the ITU, World Bank and research by National Regulatory Authorities as well as commercial providers such as Wireless Intelligence, Informa, Gartner, Buddecomm and IDC. Where appropriate, data from different sources has been combined to show more complete industry trends. The regular geographic scope of this study consists of the 54 countries of Africa – both North Africa and sub-Saharan Africa. All references to 2011 YTD correspond to the first nine months of 2011. All references to African statistics refer to the largest 25 African countries by number of mobile connections unless stated otherwise.

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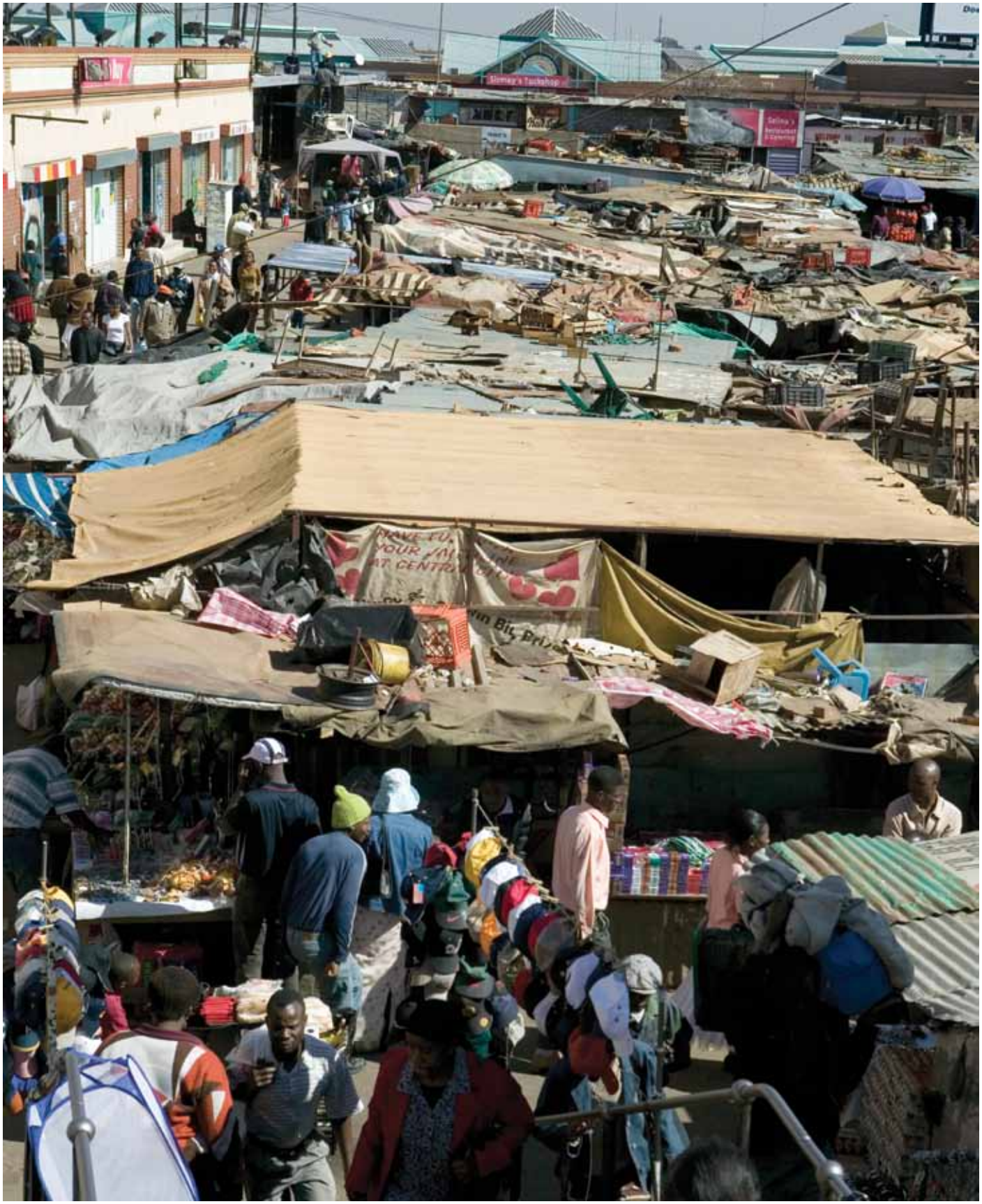
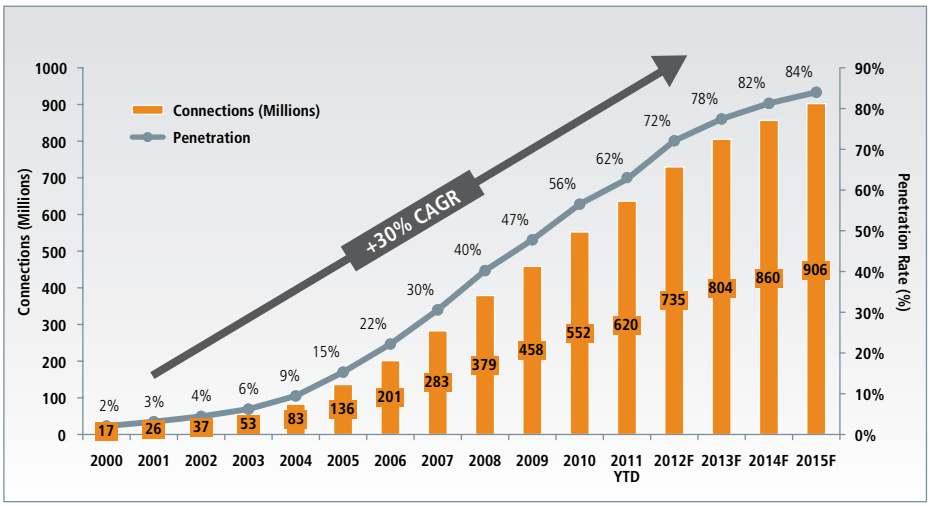

Simeo's Tuckshop

2. Executive Summary

The mobile industry in Africa is booming. With over 620 million mobile connections as of September 2011, Africa has overtaken Latin America to become the second largest mobile market in the world, after Asia. Over the past 10 years, the number of mobile connections in Africa has grown an average of 30% per year and is forecast to reach 735 million by the end of 2012.

Figure A: Total African Mobile Connections and Penetration Rate (million, % penetration)[i]

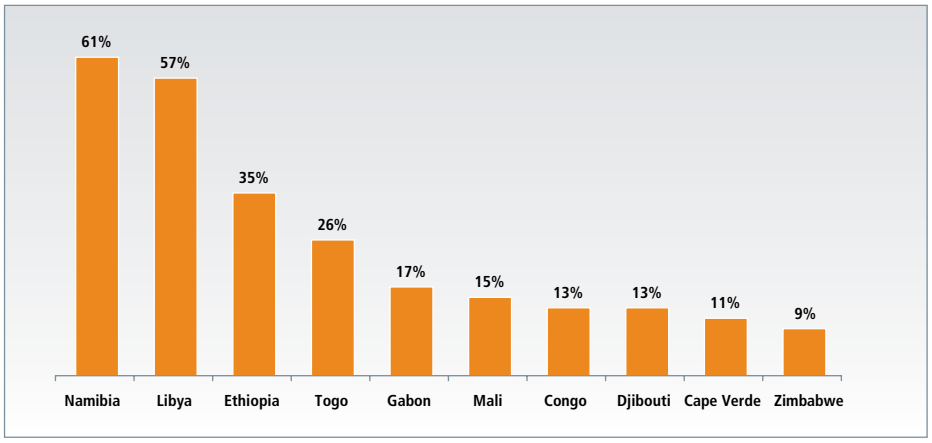


Fierce competition has driven down prices and increased penetration. Price wars have been common across the continent as operators compete for market share with innovative revenue and pricing options - operators have reduced prices an average of 18% between 2010 and 2011[ii], making mobile connectivity more broadly affordable to the masses. 96% of subscriptions are pre-paid with voice services currently dominating, however the uptake of data services is increasing rapidly. For example in Kenya data revenues, including SMS, have increased at a remarkable 67% CAGR over the last 4 years and now represent 26% of total revenues.

i Wireless Intelligence - based on active SIM connections (2011 YTD based on first 9 months data only)

ii Wireless Intelligence

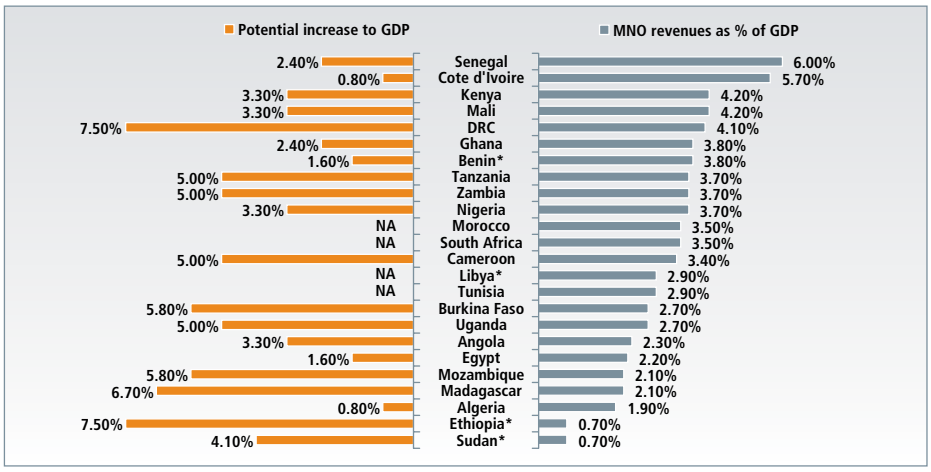
Figure B: Price reductions for voice minutes in selected markets (between March and June 2011)[iii]



The Mobile Industry in Africa contributes US$56bn to the regional economy, equivalent to 3.5% of total GDP. In particular, the mobile ecosystem is estimated to employ over 5 million Africans and is contributing to bringing mobile services to customers right across the continent.

However there remains huge untapped potential - 36% of Africans, within the 25 largest African mobile markets (A25), still have no access to mobile services. Projections indicate that raising the whole region to 100% mobile penetration (see figure 3), could add an additional $35 billion in aggregate GDP to the region, equivalent to a further 2% increase.[iv]

Figure C: The direct contribution of mobile operators to GDP in A25 countries (2010, %)[v]



The mobile industry in Africa is an enabler of economic development far beyond its immediate domain. Mobile operators have driven the emergence of a unique industry in innovative mobile services in Africa. Mobile Value-Added Services have been launched throughout the continent to enable and support agriculture, banking, education, healthcare and gender equality. In particular, the emergence of mobile money transfers and mobile banking puts Africa firmly at the forefront of the global Mobile Money industry. Beyond mobile services, the mobile industry is also contributing to rural electrical distribution with lower carbon emissions and facilitating the work of NGOs across the continent. Many African governments have prioritized ICT policy as a key driver for development.

iii Research ICT Africa – Fair Mobile Prices Q2 2011

iv Clearly, this is a simplification of the challenges which exist in achieving this goal of 100% mobile penetration, something which would take years to achieve. However, it provides an indication of what could be if mobile communication was brought to the entire African population.

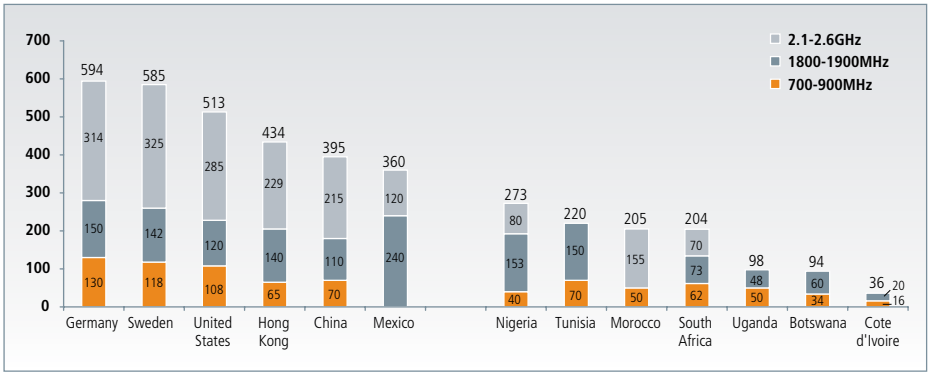
v Wireless Intelligence; EIU; Qiang 2008; A.T. Kearney analysis (Zimbabwe has been removed due to the difficulty in obtaining a reliable measure of GDP, NA – indicates countries where penetration is above 100% and a potential increase to GDP cannot be calculated, * indicates countries with extrapolated MNO revenues)

Key issues for future growth

For the mobile industry to continue to serve as a catalyst for growth, sufficient spectrum is needed for the provision of mobile broadband services. African countries have currently allocated considerably less spectrum to mobile services than developing countries in Europe, the Americas and Asia. Allocating the Digital Dividend spectrum to mobile services will enable the mobile industry to accelerate its efforts to bring connectivity and information to large swathes of rural Africa.

African governments are slowly shifting to more transparent ICT regulation, but limited spectrum availability remains a key barrier to sustaining long term growth. The GSMA supports a technology neutral approach to the use of all existing mobile bands; governments in Africa should allow deployment of mobile technologies that can technically co-exist according to what are relevant internationally harmonised bands for their region. The GSMA encourages governments in the region to establish clear guidelines for spectrum planning, licensing, pricing and re-farming. African governments must clarify future spectrum availability of both the coverage bands (700, 800, and 900 MHz bands) and the capacity bands (1800, 2100, 2300, 2600, and 3500 MHz bands).

Figure D: Spectrum licensed in selected African and non-African countries[vi]



Regulation practices must continue to improve to ensure the effective long term development of the mobile sector. 64% of African countries remain in the bottom quartile of the World Economic Forum's political/regulatory index. GSMA research indicates that total tax intake of governments could be boosted, by reducing mobile specific taxes across Africa. Universal access has also been promoted by most African governments using taxation schemes, but there is limited transparency around the distribution of funds.

By working in partnership, mobile operators and African governments can continue the remarkable growth story of the African mobile industry. The benefits that mobile services have already brought to hundreds of millions of Africans can be extended to those who have yet to connect. By so doing, the African continent can continue to bring not only communication services, but also improved financial services, healthcare and education to its people and drive an increase in the economic wealth and development.

vi GSMA, National regulators

3. Competitive landscape and consolidation

Key Messages:

With over 620 million mobile connections as of September 2011, Africa has overtaken Latin America to become the second largest mobile market in the world, after Asia

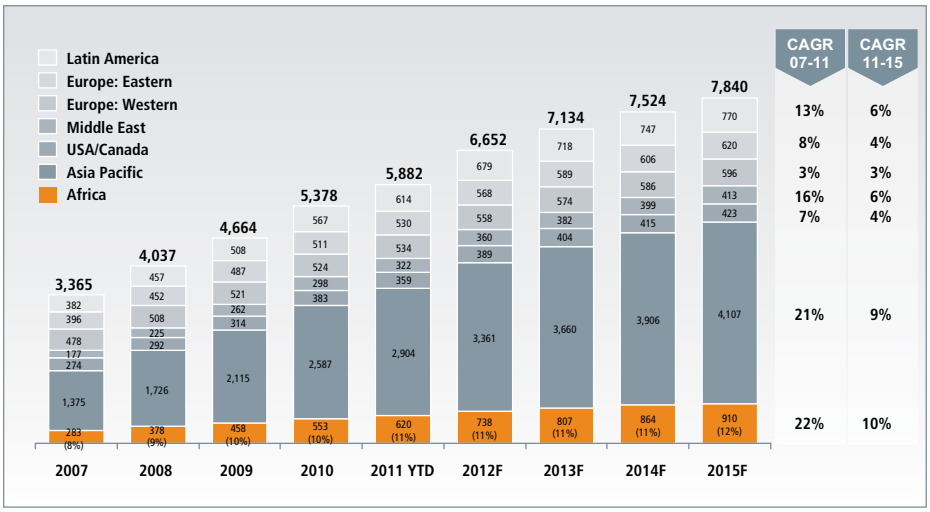
Africa continues to be the fastest growing mobile market in the world

The African mobile market is highly competitive and has experienced significant price reductions over the period 2007-2011, with decreases of up to 60% in a matter of months in some markets

3.1. Market dynamics

In 2010, the total number of mobile connections in Africa surpassed both Western Europe and Eastern Europe for the first time. As of September 2011, with 620m connections, Africa has overtaken Latin America, making it the second largest mobile market in the world after Asia Pacific. From 2007-2011, the number of connections has more than doubled from 283m to 620m. This represents a staggering 22% CAGR over these four years and the growth is expected to continue at the fastest rate of all global regions over the next 4 years.

Figure 2: Global Mobile Connections by Region (million)[6]



The significant growth in mobile subscribers in Africa has been driven by several key factors:

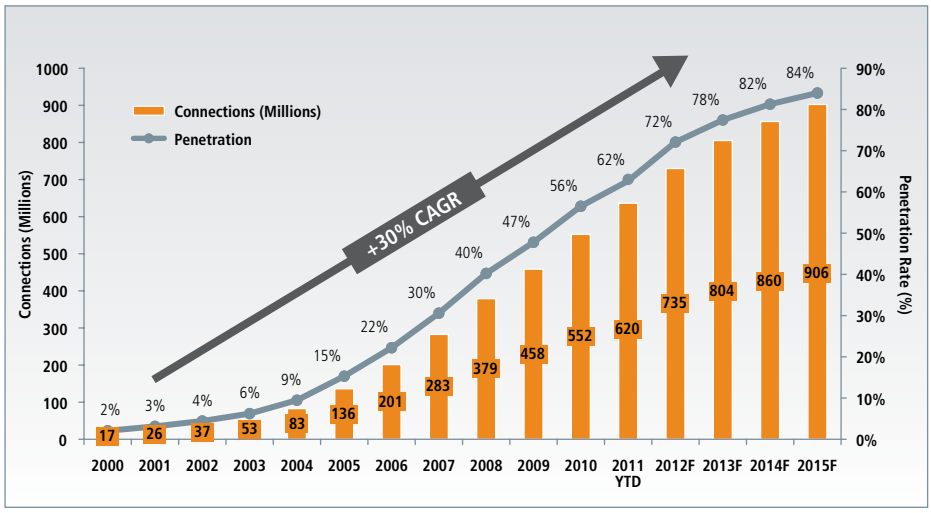
- The opening of markets to the forces of globalisation and foreign direct investment
- The introduction of low-cost handsets and the reduction of mobile usage prices, driving down the minimum cost of mobile ownership
- Substantial economic development in the region, increasing the prosperity of citizens and hence an increasing affordability of communication services
- The success of cost-effective pre-paid services (96% of African connections vs 82% in Latin America and 52% in Europe in 2011) allowing consumers to take control of their spending and gain access to flexible, low-cost voice and SMS services
- The ambitious rollout of mobile network infrastructure by operators to expand geographic and population coverage combined with the lack of adequate fixed-line infrastructure and service

These factors have contributed to a growth in mobile population penetration across Africa from 2% in 2000 to more than 57% ten years later (see Figure 3). 2010 was a land-mark year for Africa as mobile penetration passed 50% for the first time. Despite this impressive growth, these figures go to underline the further growth potential and necessary investment required to connect the remaining population. Whilst mobile connection growth is expected to slow to 11% CAGR from 2011 to 2015, in several markets such as Zimbabwe and Rwanda connections are still growing at 50% p.a. from a low existing customer base. By 2015, the total number of connections is estimated to reach 84% of the total African population.

6 Wireless Intelligence - based on active SIM connections

Throughout this report, we predominantly refer to the number of subscriptions, or number of connections as a measure of mobile penetration. It is well understood that the use of multiple SIMs is very common among Africans such that the total number of connections will overestimate the number of actual mobile customers by some margin. However, accurate data on the number of customers is not readily available for all of Africa whereas the number of connections is known for the whole continent. The prevalence of multi-SIM usage is likely to be such that the number of connections may overstate the number of subscribers by 20-40%.

Figure 3: Total African Mobile Connections and Penetration Rate (million, % penetration)[7]



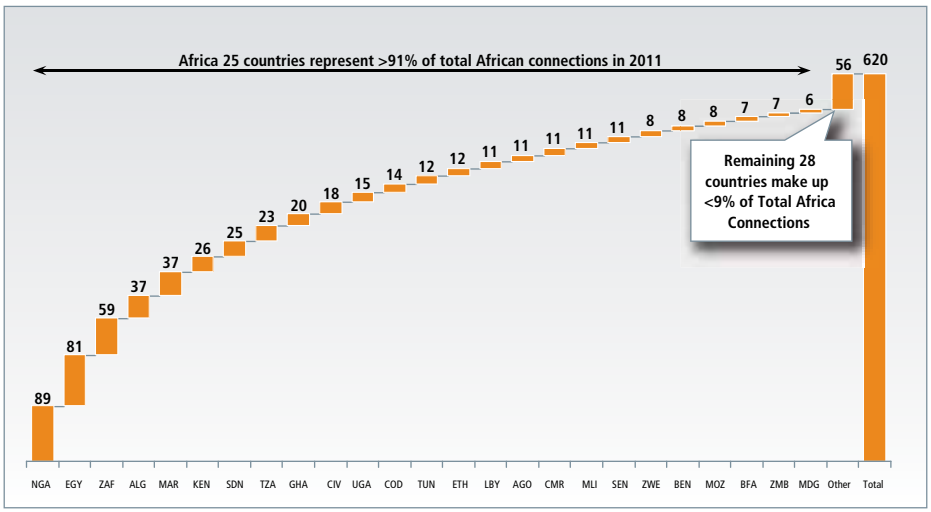
With 54 countries, 1.0 billion people and hundreds of ethnic groups, cultures, languages and dialects, Africa is a highly diverse continent. Nigeria alone has nearly 400 native languages, whilst Ethiopia has 70 unique languages with 200 different dialects. In Burkina Faso, 60 ethnic groups co-exist within the population of 16 million. Referring to Africa as one continent would be to overlook the complexities of a huge diversity of peoples, languages and cultures, within and across national boundaries.

It would be impossible to cover all these countries in detail. Additionally, the availability and reliability of data varies considerably between countries. Therefore, within this report we consider the 25 countries shown in Figure 4 which represent 91% of the continent's mobile connections. These markets (referred to as the A25) are extremely diverse economically, culturally, geographically and politically and are therefore a good representation of Africa as a whole.

For the purposes of this report, countries outside the A25 will be included through a number of case study examples which highlight their unique characteristics, market developments or leading innovations.

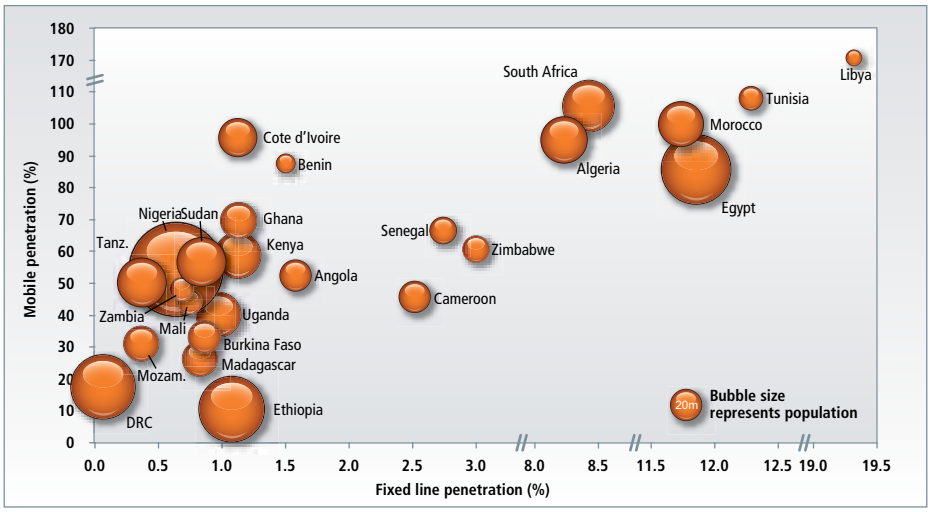
7 Wireless Intelligence - based on active SIM connections (2011 YTD based on first 9 months data only)

Figure 4: Breakdown of Africa25 and Africa53 Connections (2011 Q3, million)[8]



As can be seen in Figure 5, mobile services are the primary means of voice communication for many of the inhabitants of Africa, as fixed-line penetration remains at very low levels in much of the continent. Of particular note are countries such as Cote d'Ivoire and Benin which have 95% and 87% mobile penetration, but less than 1% and 2% fixed-line penetration respectively. Even in the more developed countries in Africa, such as Algeria and South Africa, fixed-line penetration remains below 10%. In most of the countries of the region, fixed-line penetration is unlikely to grow further as this would require extensive investments in infrastructure. Consequently, the mobile phone will remain the predominant means of communication for the majority of people.

Figure 5: Fixed and Mobile penetration in A25 (2010 Q4, % penetration)[9]

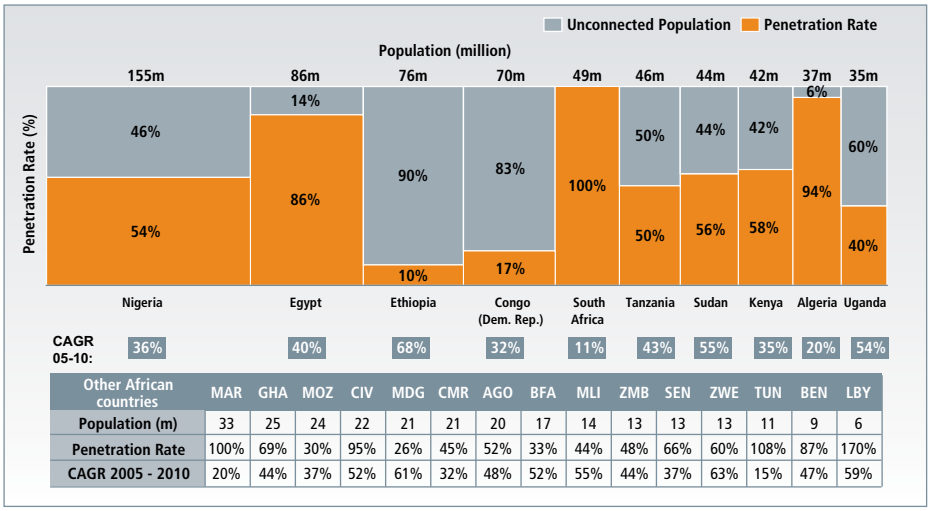


8 Wireless Intelligence - based on active SIM connections

9 Wireless intelligence, ITU, EIU, A.T. Kearney analysis - mobile penetration based on active SIM connections

Over the past 5 years, every A25 country has experienced double-digit annual growth in connections with 21 of the 25 countries seeing growth of over 30% CAGR from 2005 to 2010 (see Figure 6). Some countries, such as Ethiopia, Zimbabwe and Madagascar have seen growth of over 60% CAGR from 2005 to 2010. Even more developed countries with over 100% penetration such as South Africa, Tunisia and Morocco have experienced growth of 11-20% CAGR in the past 5 years.

Figure 6: A25 Market size and growth rates by connections (2010 Q4)[10]



Other African countries	MAR	GHA	MOZ	CIV	MDG	CMR	AGO	BFA	MLI	ZMB	SEN	ZWE	TUN	BEN	LBY
Population (m)	33	25	24	22	21	21	20	17	14	13	13	13	11	9	6
Penetration Rate	100%	69%	30%	95%	26%	45%	52%	33%	44%	48%	66%	60%	108%	87%	170%
CAGR 2005 - 2010	20%	44%	37%	52%	61%	32%	48%	52%	55%	44%	37%	63%	15%	47%	59%

The mobile penetration rates across the countries of the A25 vary significantly (see Figure 7), from 170% in Libya[11] to just 10% in Ethiopia (Ethiopia's neighbour, Eritrea which is outside the A25 has a mobile penetration rate of only 4%). In the A25, four countries (Libya, South Africa, Morocco and Tunisia) have penetration rates over 100% highlighting the extensive use of multiple SIMs by mobile users in Africa.

Interestingly, many of the most populous countries in Africa also have a lower than average penetration rate. In the top 10 most populous countries, there are around 300 million people without a mobile connection.

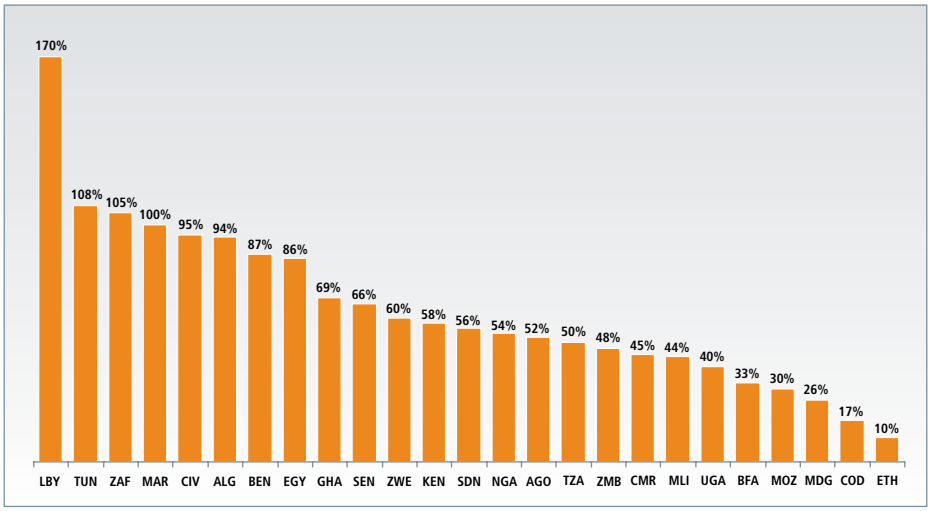
As mentioned earlier, in almost all countries in Africa, the tendency to use multiple SIM cards will lead to an over-counting of the number of individual mobile phone subscribers. A report by Buddecomm estimated that 20-25% of the active connections in both Egypt and South Africa can be attributed to second handsets or SIMs. It is believed, that his percentage may be much higher in the less developed African nations. This means that the number of people in Egypt without a mobile phone could potentially be double that suggested by the number of active connections.

Mobile users have many reasons to use multiple SIM cards, such as taking advantage of attractive promotions from different operators (long distance calling, own-network preferential rates and product bundles). In the Democratic Republic of Congo, connectivity problems between networks and coverage limitations can also prompt subscribers to use multiple SIM cards to switch between operators.

10 Wireless Intelligence, A.T. Kearney analysis - mobile penetration based on active SIM connections

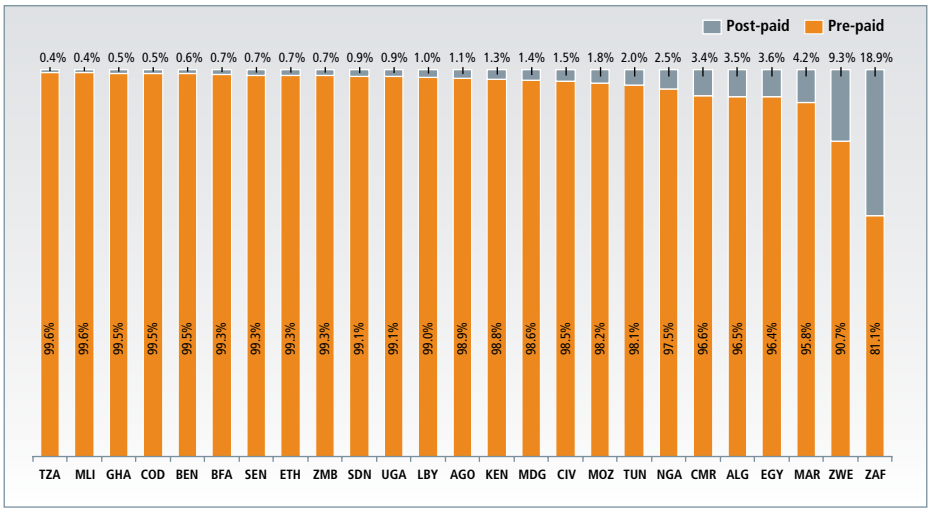
11 Libya's exceptionally high penetration figures associated with the high prevalence of multiple SIMs/handsets

Figure 7: Mobile penetration in the A25 countries (2010 Q4, % penetration)[12]



One of the key growth drivers for mobile penetration in Africa has been the increasing availability of low cost pre-paid services. Pre-paid pricing offers mass-market consumers the option to access mobile services at a much lower entry price and with fewer barriers than post-paid contracts – for example, low denomination cards of CFA500 (US$1.07) in Cote d'Ivoire. Perhaps more importantly, pre-paid services offer consumers with irregular and low incomes the flexibility to purchase mobile credits only when they can afford to and without the commitment to a 1-3 year contract requiring regular monthly payments. Additionally, with limited credit-checking facilities across Africa, the provision of post-paid services tends to be more complex for operators who have few means of determining an individual's ability to pay, or indeed collect payments in such an environment. It is not surprising therefore that pre-paid connections are prevalent across the region (see Figure 8), accounting for 96% of all connections compared to 52% in Europe and 82% in Latin America. In 11 countries within the A25, pre-paid connections account for over 99% of all mobile connections, with the relatively more affluent South Africa having the greatest share of post-paid connections at 19%.

Figure 8: Pre-paid and Post-paid connection share for A25 countries (Q2 2011, %)[13]



12 Wireless Intelligence, A.T. Kearney analysis - based on active SIM connections

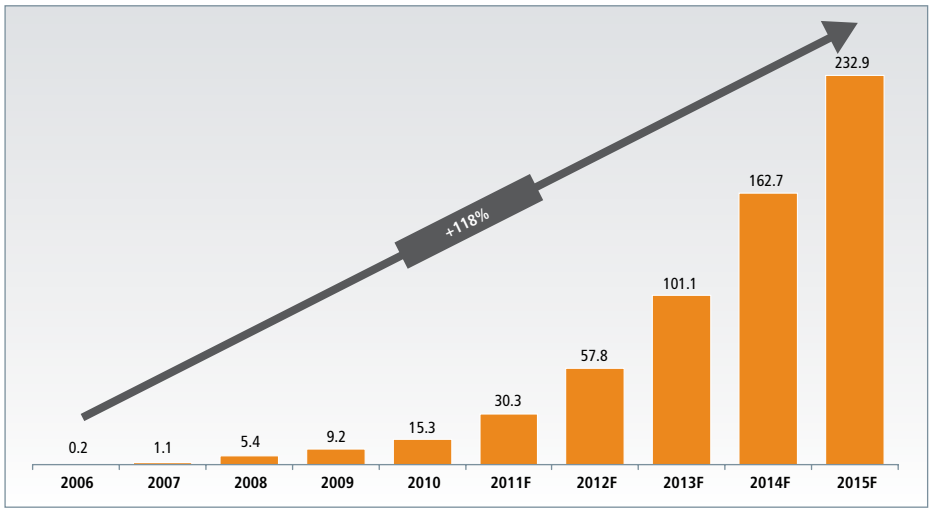
13 Wireless Intelligence, based on active SIM connections

Internet access in Africa has been mainly limited to those who could afford expensive fixed-line services, usually limited to major urban centres. Similarly, satellite internet access has remained too costly for the vast majority. As a result, many rely on internet cafes and government institutions to access the internet, particularly in sub-Saharan Africa. However, internet access has been significantly boosted by improved mobile coverage and the launch of GPRS, EDGE and 3G technologies. Mobile operators have made substantial investments in the UMTS family of technologies[14] and WiMax, to bring internet services to a mass market of Africans.

In addition to investments in wireless access infrastructure needed to deliver mobile internet, further investments have been made in the back-haul capacity needed to connect mobile networks to the global internet. Africa has seen strong investment in submarine fibre optic cables over the last decade, a trend that is expected to continue. Telegeography estimates that from 2010-2012 there will be an additional $2.8bn invested in submarine fibre cables in Africa. The activation of cables such as TEAMs, Seacom, SAT-3 and Lion has provided much needed bandwidth and made possible the provision of services available in more developed economies, and at lower prices, as the supply of bandwidth increases. This has already been seen in South Africa, where the introduction of new capacity by Seacom led to submarine cable access prices declining by 70-90%. In order for end-users to benefit from these price declines, interconnection with terrestrial networks is necessary. However, terrestrial backbone is expensive and requires substantial investment in international and national transmission links. Some progress has been made in sub-Saharan Africa, for example the planned East Africa Backhaul system to connect Burundi, Kenya, Rwanda and Tanzania. But Central Africa is lagging behind with much more investment need to bring the cost benefit of new bandwidth to the majority of the Africa population.

Mobile networks are leading the expansion of broadband internet access across Africa, with broadband access today largely confined to a small minority of the more developed Africa countries. Poor infrastructure remains a key barrier to the expansion of broadband. However, the roll-out of 3G services has provided a viable alternative to fixed broadband, in the form of internet enabled handsets and wireless modems/dongles. Whilst penetration rates are still low, to date growth in mobile broadband has been exponential and the explosive growth is expected through to at least 2015. The number of connections has increased from c. 0.2m in 2006 to c. 15m by the end of 2010 and is expected to hit over 230m by 2015 (see Figure 9). Such is the growth predicted, that Cisco estimates that by 2015, sub-Saharan Africa will have more people with mobile access than with access to electricity at home.

Figure 9: Mobile broadband connections in Africa[15]

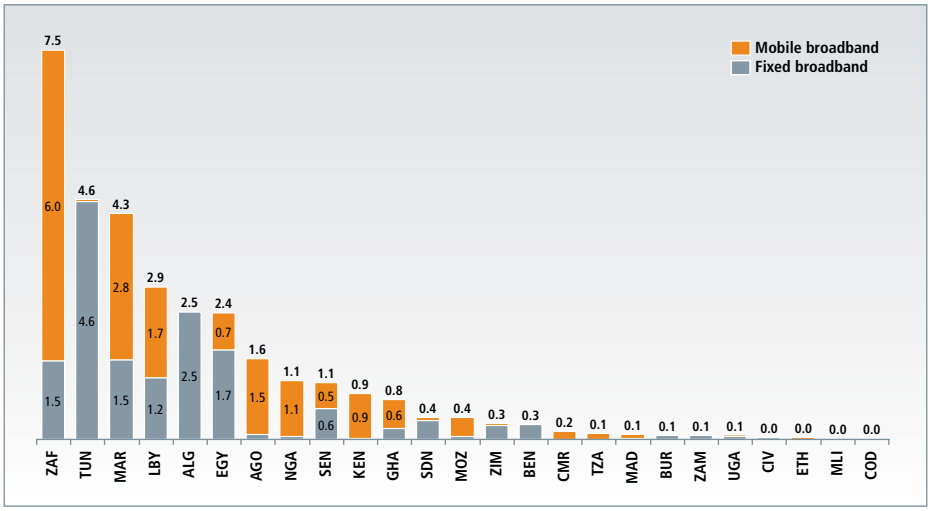


14 Including W-CDMA HSPA and CDMA1x EV-DO

15 Wireless Intelligence: Q4 each year based on technology; # of subscriptions to CDMA 2000 1xEV-DO (Rev. A and Rev. B), WCDMA HSPA and LTE

South Africa, with its more developed infrastructure leads the way in terms of mobile broadband penetration (see Figure 10). Some African countries have only recently awarded 3G licences, with operators yet to launch mobile broadband services; for example the 3G tender process in Algeria was only launched in September 2011. Mobile broadband penetration remains very low in sub-Saharan Africa where operators are yet to launch extensive 3G services and limited infrastructure still remains a key barrier to growth.

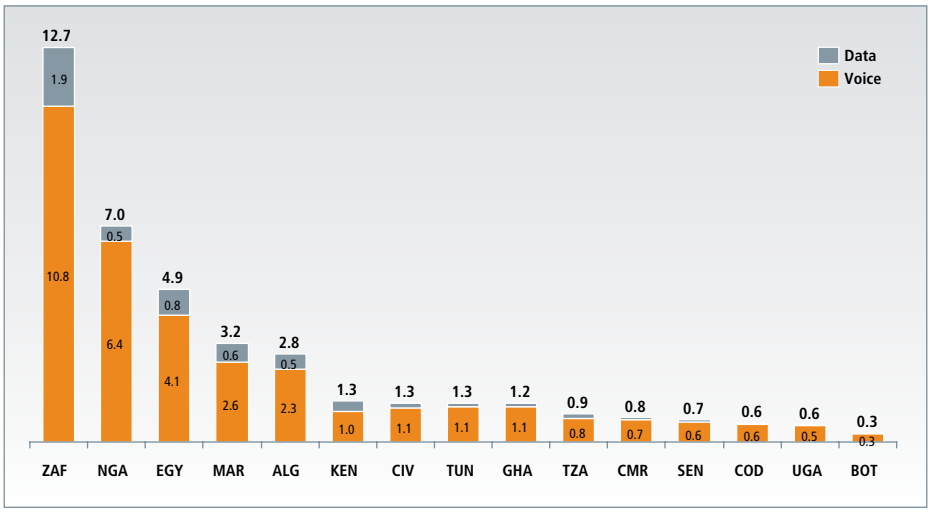
Figure 10: Estimated fixed and mobile broadband penetration in the A25 countries (%)[16]



3.2. Revenue and pricing trends

Across Africa, voice services dominate mobile usage and operator revenues (see Figure 11). South African and Nigerian voice services represented 85% and 93% of operator revenues respectively in 2010. However, the uptake of data services is increasing rapidly. In Kenya, data revenues have increased at a staggering 67% CAGR over the last four years and now represent 26% of total revenues. This trend can be attributed to the launch and uptake of 3G and Value-Added Services such as mobile banking.

Figure 11: Total mobile revenues by service for selected countries (US$ billion, 2010)[17]



16 Informa, ITU, EIU, A.T. Kearney analysis (mobile broadband is based on W-CDMA HSPA and CDMA1x EV-DO technologies)

17 GSMA

While industry revenues have broadly increased, in many parts of Africa price wars have driven down prices as operators fight for market share (see Figure 15). In addition to simple price reductions, a number of innovative revenue and pricing options have been introduced into some African mobile markets:

- **Free international roaming**
  MTN One World allows customers to pay their local rates for calls whilst roaming in the 21 countries in Africa and the Middle East in which MTN operates.

  Zain's One Network allows free international roaming across 13 African countries (plus 3 Middle Eastern countries) allowing calls to be made at local rates throughout the region[18]

  South Africa's Vodafone Passport allows contract customers to take their home tariff with them when travelling overseas

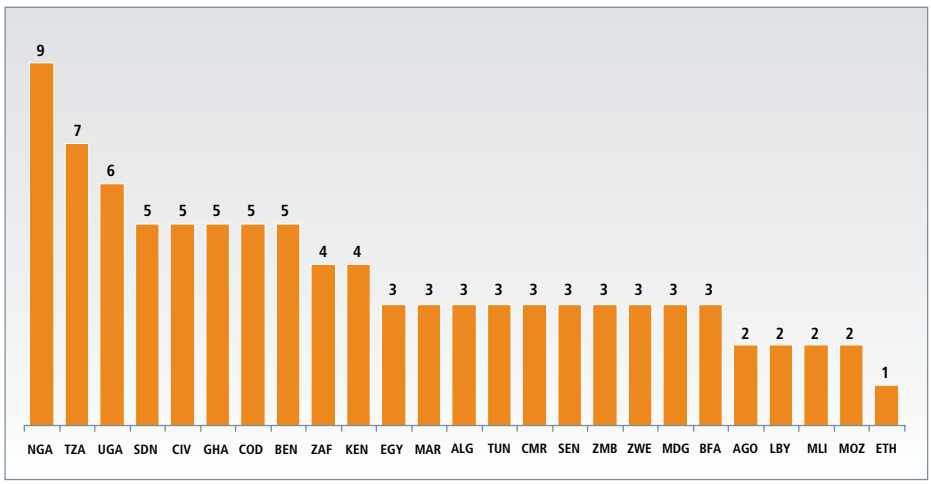
- **Traffic load based pricing**
  MTN launched MTN Zone which offers discounts of up to 95% depending on network load at the time. Discounts are updated hourly and apply to MTN-MTN calls. Customers are informed of the changing tariffs via the cell info display on their phones and an automated messages appears when they initiate a call

- **Bundled packaging**
  Most pre-paid connections are based on unbundled services, however some operators have begun to launch bundled offerings. For example: Airtel Nigeria offers mobile internet bundles, in South Africa MTN offers SMS bundles and Mobinil provides music download bundles to users in Egypt.

3.3. Competitive intensity

Competition in the African mobile market is increasingly intense. There are 8 countries in the A25 with 5 or more mobile operators (see Figure 12). Nigeria has the highest number of licensed operators in one market with 9. The top 3 operators in Nigeria hold 85% of the mobile market with the remaining 15% distributed amongst the remaining 6 operators. Few true monopolies remain across the continent, with Ethio-Mobile in Ethiopia and a handful of former state fixed-line incumbents being the exception to the highly-competitive African market.

Figure 12: Number of wireless operators in A25 markets (2010)[19]

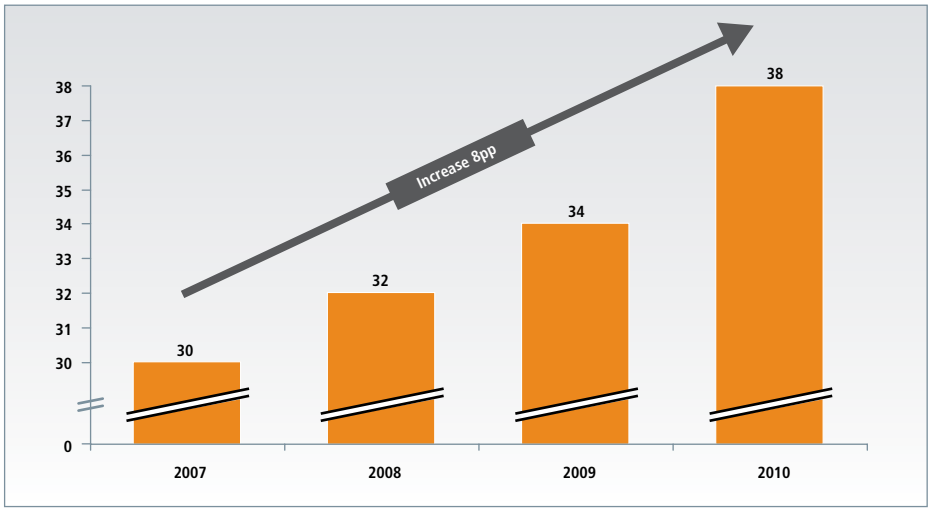


18 Zain One Network is available in Sudan, Ghana, Niger, Uganda, Burkina Faso, Republic of Congo, Democratic Republic of Congo, Gabon, Chad, Tanzania, Kenya, Malawi and Nigeria plus Jordan, Bahrain and Iraq

19 Wireless Intelligence

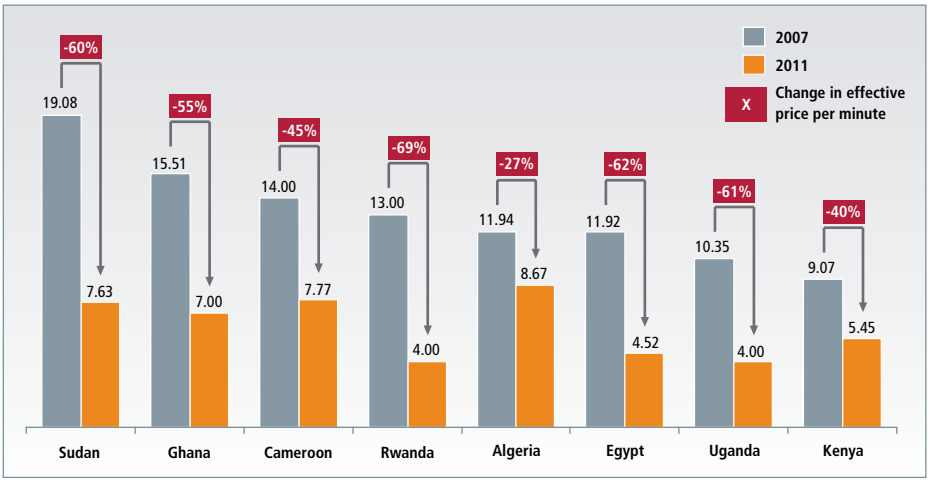
In addition to the number of competing operators in each market, growth in churn rates provides evidence of the strong competitive intensity prevailing today in the African mobile industry. Customers are discerning, changing providers as more attractive deals become available and frequently owning multiple SIMs to take advantage of attractive promotions from multiple operators. As a result churn rates have increased substantially since 2007 (see Figure 13).

Figure 13: Evolution of average customer annual churn rates in Africa[20]



Evidence of intensifying competition in the African mobile market can also be seen from the declining Average Revenue per User (ARPU) over recent years (see Figure 14). ARPU's have seen particularly sharp declines over the past 4 years in countries such as Rwanda (69%), Egypt (62%), Uganda (61%) and Sudan (60%). ARPUs in some countries are as low as $4 per user per month, with many customer segments spending considerably less than the average.

Figure 14: Average Revenue Per User (ARPU) for selected markets (US$, 2007-2011)[21]

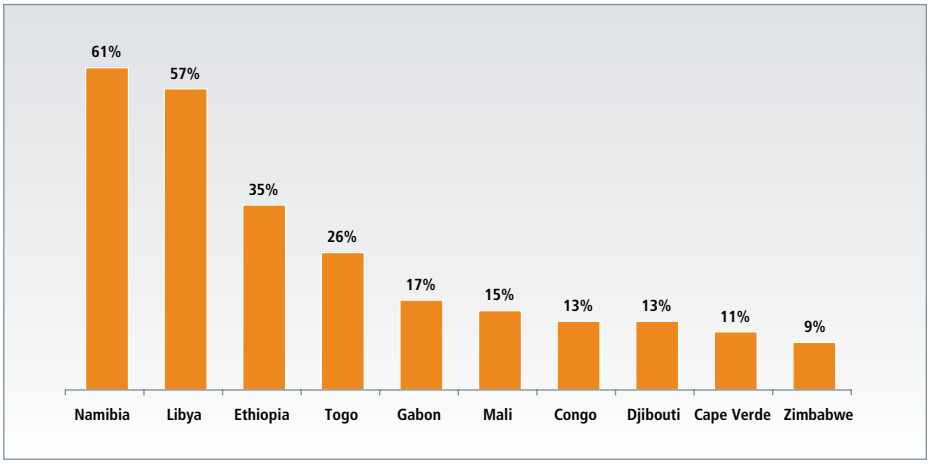


20 GSMA - average of 12 African countries

21 Wireless Intelligence, Merrill Lynch Wireless Matrix

These declines in ARPU are partially driven by price decreases, but also by the increasing use of multiple-SIMs and increased penetration into low-income segments as prices fall within the discretionary income bracket of these consumers. Some countries in the region have seen fierce price wars during 2011 with the price of the best available tariff in Namibia falling by 61% during the second quarter of the year (see Figure 15) with similar reductions in other countries. For a selection of mobile operators[22] across the whole of Africa, the effective price per minute for voice services has fallen by 18% between Q2 2010 and Q2 2011.

Figure 15: Price reductions for voice minutes in selected markets (between March and June 2011)[23]



Unprecedented decreases in termination rates (interconnection charges) resulted in greater retail price competition. The drop in the wholesale rate enabled smaller operators to undercut the dominant mobile operator (MTC), who responded by lowering their prices and dramatically decreasing prices across the entire market.

22 Average based on data from 13 African operators from countries including Algeria, Angola, Egypt, Nigeria, Tanzania, Mozambique, Democratic Republic of Congo and South Africa. Source: Wireless Intelligence

23 Research ICT Africa – Fair Mobile Prices Q2 2011

4. The economic contribution of the mobile industry

Key Messages:

Mobile operators' revenues in the A25 contributed US$49 billion in 2010, equivalent to 3.0% of aggregated GDP

The total value add of the mobile ecosystem in the A25 is US$56 billion, equivalent to 3.5% of GDP

The mobile ecosystem plays a major role in regional employment with 5.4 million people either directly or indirectly employed in the broader mobile ecosystem[24]

The mobile ecosystem is a major contributor to public funding with US$15 billion generated through corporate, income & indirect taxes, social security and regulatory fees

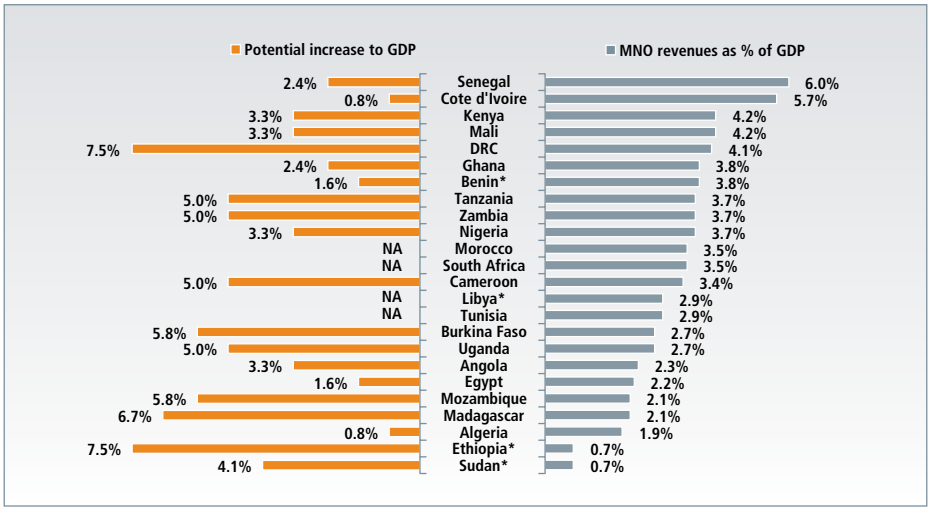
The previous chapter highlighted the dynamism and growth of the mobile industry in Africa and also the potential to reach the as-yet unconnected members of the population. In this chapter, we focus on the economic contribution – both direct and indirect – of the mobile industry to the total GDP of countries in Africa.

4.1. The direct contribution of mobile operators to GDP

The incredible up-take of mobile services across Africa in recent years has resulted in total revenues of mobile operators in the A25 reaching US$49 billion in 2010 (scaling up to all of Africa this figure is likely to be around US$53 billion[25]). This equates to a direct contribution of 3.0% to aggregate GDP. At country level, the direct contribution to GDP ranges from 0.7% in Sudan and Ethiopia, up to 6.0% in Senegal (see Figure 16).

In recent studies by the World Bank and others, it was shown that there is a direct relationship between mobile penetration and GDP. In developing countries, it has been shown that for every 10% increase in mobile penetration there is a 0.81% point increase in a country's GDP (in developed countries this figure falls to a 0.60% contribution). Applying this relationship to the A25 countries indicates that raising the whole region to 100% mobile penetration could add over $35 billion in aggregate GDP to the region, an increase of 2%. We do not underestimate the challenges in achieving a goal of 100% penetration. However, this does indicate what could be achieved by governments and operators if they work together to bring mobile communication to the entire African population.

Figure 16: The direct contribution of mobile operators to GDP in A25 countries (2010, %)[26]



4.2. The value-add of the mobile ecosystem

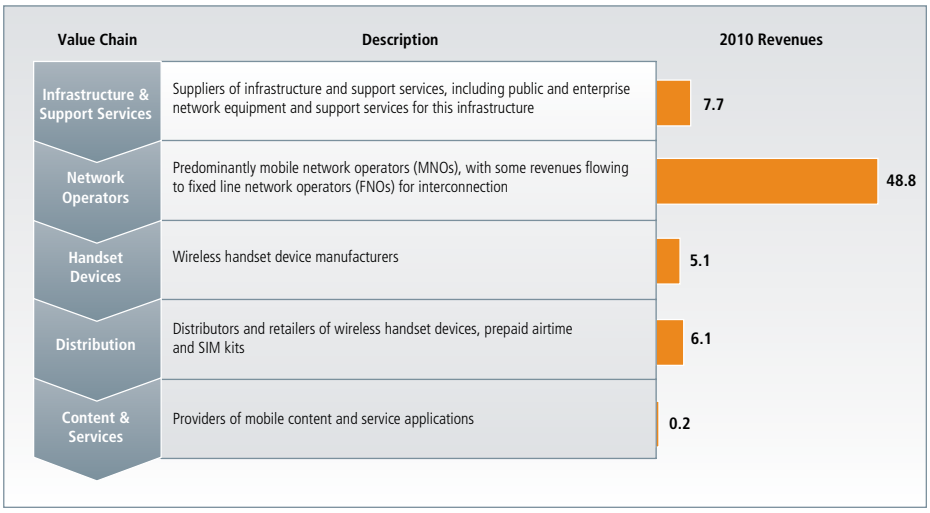
Beyond the direct efforts of mobile operators, there is a much wider ecosystem of organisations and individuals that contribute to delivering mobile communications for society and to regional economic output. It is important that the economic value created for society by this whole ecosystem is considered. Holistically, the ecosystem or value chain for mobile services consists of five major groups: Infrastructure vendors and support services, the network operators themselves, handset and device manufacturers, distributors and retailers, and content and service providers (see Figure 17). Mobile operators contribute approximately 72% of the whole ecosystem revenues.

24 Mobile ecosystem is considered broadly to consist of 5 groups: Infrastructure vendors and support services, the network operators themselves, handset and device manufacturers, distributors and retailers, and content and service providers

25 Estimate is scaled up based on the GDP of A25 countries relative to the whole of Africa. A25 countries represent 92% of total African GDP

26 Wireless Intelligence; EIU; Qiang 2008; A.T. Kearney analysis (Zimbabwe has been removed due to the difficulty in obtaining a reliable measure of GDP, NA – indicates countries where penetration is above 100% and a potential increase to GDP cannot be calculated, * indicates countries with extrapolated MNO revenues)

Figure 17: Description and size of the mobile ecosystem/value chain in the A25 (2010, US$ billions)[27]



To estimate the direct and indirect economic contribution of the mobile ecosystem, a structured framework was used (see Figure 18) that considered the following factors:

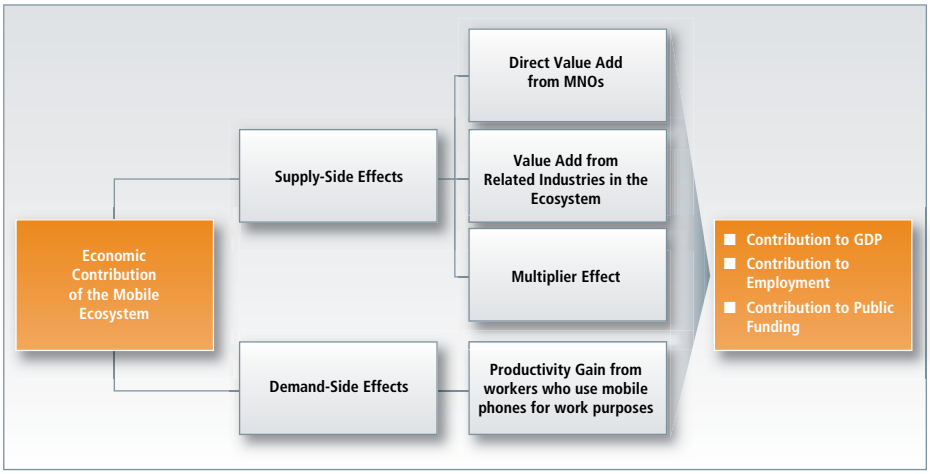
Supply-side Impact

- The direct contribution of mobile network operators
- The direct contribution of other industries in the mobile industry ecosystem (see above)
- The indirect impact of the wider economy of the "multiplier effect"

Demand-side Impact

- Productivity gains in the wider economy from workers using mobile technologies (mobile workers)

Figure 18: Framework for Calculating the Mobile Ecosystem's Economic Contribution



27 A.T. Kearney research and analysis

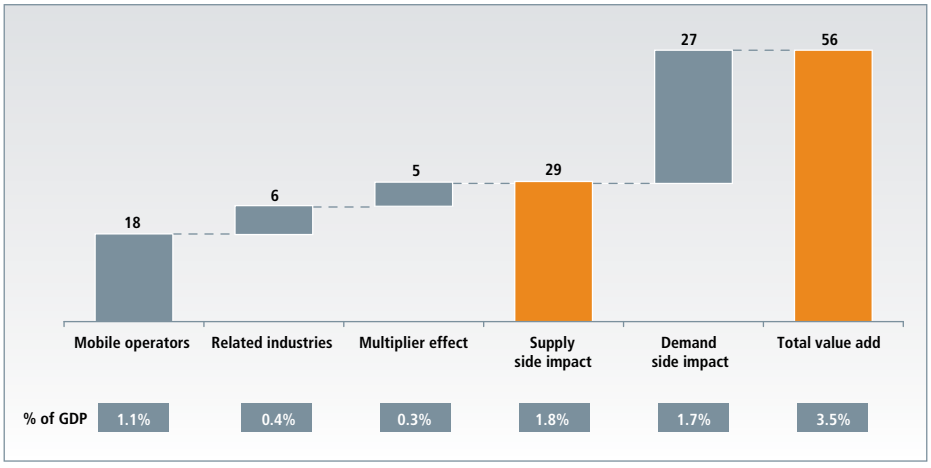
To determine the mobile ecosystem's supply side effects on the economy, the Economic Value Add[28] of Mobile Network Operators (MNOs) and adjacent industries was estimated based on a sample of companies across the value chain in various countries in the A25. A multiplier[29] was then applied to the direct contribution of the mobile ecosystem to estimate the impact on other industries. The results showed that the supply side impact from the mobile ecosystem on the greater economy contributed approximately US$29 billion in the A25 or 1.8% of GDP[30].

However, the economic impact extends beyond the supply side effects. It has also greatly improved the productivity of workers who use mobile technologies in their daily lives. This impacts a broad range of individuals from chief executives who communicate with their teams while travelling, to the doctors responding to patients and technicians who are able to receive notifications while on the road and thus reduce wasteful travel. For a country's workforce mobile technology enables better coordination of activities, more efficient allocation of resources and a reduction in unnecessary travel.

To evaluate the economic impact resulting from such productivity gains, the percentage of mobile workers in each countries' workforce[31] and their average GDP contribution was estimated (total GDP divided by total workforce) and multiplied by the expected productivity gain from mobile connectivity usage. The productivity gain factor used was approximately 7.6% based on a range of estimates from previous studies[32]. The productivity gain was proven to be very significant contributing over US$27.1bn across A25 countries, equivalent to 1.7% of the aggregate GDP. It is particularly important to consider the mobile industry's contribution to productivity gains in developing countries where alternative fixed-line communication systems are less prevalent.

In total, the direct and indirect economic contributions to the mobile ecosystem in the A25 amount to approximately US$56 billion or 3.5% of aggregate GDP (scaling this up to all of Africa suggests a total of US$60.7 billion[25]). The ripple effect from the direct contribution of mobile operators on to the rest of the mobile ecosystem and the economy at large has a larger contribution than originally thought. Across the A25 countries, the overall contribution of the mobile ecosystem is three times greater than the direct contribution of the mobile operators.

Figure 19: Mobile Ecosystem Economic Value Add (VA) in A25 (US$ billions)[33]



28 Value Add was used rather than revenues in order to avoid double counting of revenue flows within the value chain. Value Add = EBIT + Wages – CAPEX – Depreciation (or approximately Revenues – Cost of Sales)

29 A multiplier of 1.2 was used to model the intangible additional Value Add and workforce increases based on previous GSMA studies for Africa

30 This figure is lower than mobile operator revenues due to operator costs associated with non-mobile ecosystem industries (e.g. rent and power), and costs paid to ecosystem players outside Africa (e.g. costs paid equipment vendors with R&D/ manufacturing outside Africa)

31 To assess the percentage of mobile workers in the economy, various studies were leveraged including studies conducted for Telenor and IDC in addition to A.T. Kearney benchmarks. To determine the % of mobile workforce the correlation between the GDP per capita (at PPP) to the % of mobile workers for selected countries was established. Subsequently, linear interpolations were used to determine the data missing for certain countries. While it can be argued that GDP per capita and mobile workers % may be partially interrelated, this study does not believe they are fully dependent on one another

32 Previous studies include Deloitte-Telenor, Economic Impact of Mobile Communications, 2008 and McKinsey & Company, Wireless Unbound: The Surprising Economic Value and Untapped Potential of the Mobile Phone, 2006

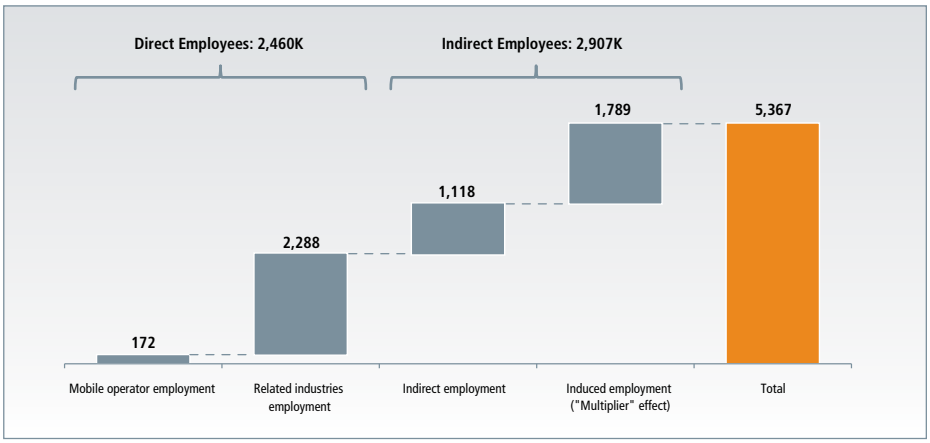
33 A.T. Kearney analysis

4.3. Contribution to employment

In addition, the mobile ecosystem is also a significant contributor to employment in Africa. In 2010, approximately 5.4m people were employed directly and indirectly in the mobile ecosystem in the A25 countries. (Scaling this up to all of Africa based on GDP suggests a total employment of 5.8m – 1.4% of the total African workforce[34]):

- 2.5 million people in the A25 employed directly by mobile operators and their suppliers, of which 172,000 are directly employed by mobile operators
- 1.1 million indirect jobs in the A25 from support services and the mobile industry's contribution to public funding
- 1.8 million jobs in the A25 generated by the multiplier effect i.e. by the mobile industry's direct and indirect employee spend

Figure 20: Mobile Ecosystem Contribution to Employment in A25 ('000s of Employees, 2010)[35]



4.4. Contribution to public funding

The mobile ecosystem also makes a major contribution to African public finances through various levers including VAT/indirect tax, corporate tax, social security taxes of direct and indirect employees, income taxes and regulatory fees (universal service fees).

A.T. Kearney analysis estimates that in 2010 the mobile ecosystem's total contribution to public funding amounted to around US$15bn in the A25 (scaling up by GDP for all of Africa suggests a total contribution of US$16bn – 4.1% of total African government revenues[36]). Of this, mobile operators directly generated 20% (US$2.9bn) with the majority of the remaining contribution (59%, US$8.6bn) being made from VAT and indirect tax induced in the wider economy by the mobile industry.

In some specific cases, mobile operators contribute a significant portion of a state's total tax revenue, for example, in 2008 MTN accounted for 5% of the total tax revenue in Ghana[37].

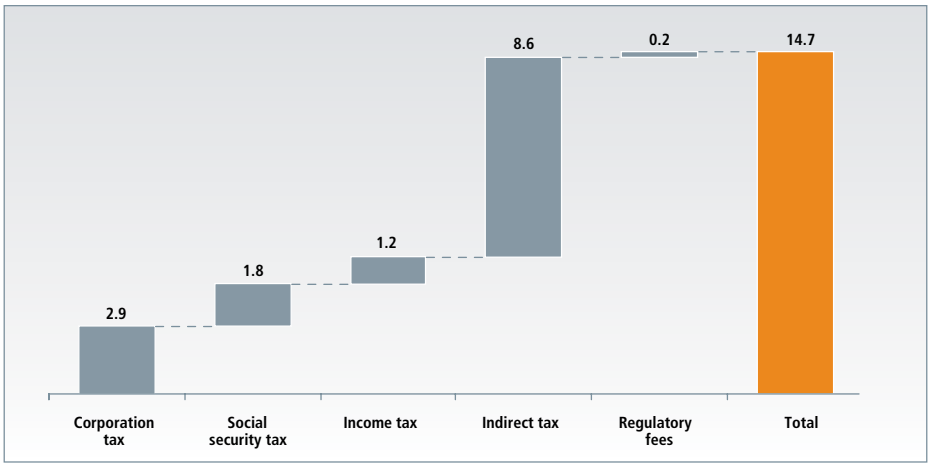
34 Economically active population of Africa was 413.5m in 2010. Source: Africa Development Bank Statistical Yearbook 2011. A25 countries represent 92% of total African GDP.

35 A.T. Kearney analysis

36 Total government revenue in 2009 was US$392.1bn (26.5% of GDP) Source: Africa Development Bank Statistical Yearbook 2011. A25 countries represent 92% of total African GDP

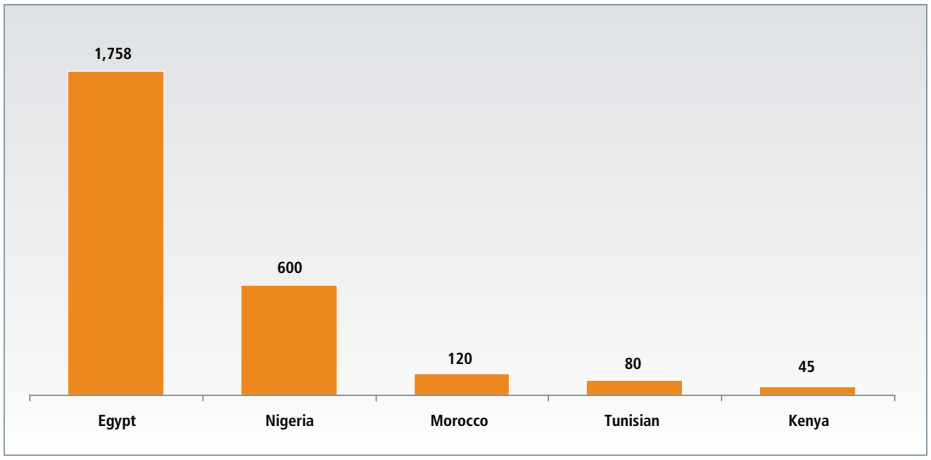
37 Ms Efua Falconer, Acting Senior Manager of Corporate Communications at MTN Ghana reported in www.ghanabusinessnews.com, October 2009..

Figure 21: Mobile Ecosystem Contribution to Public Funding in A25 (US$ billions)[38]



In addition to general taxation, mobile operators contributed to public finances through the purchase of spectrum licence fees. A particular beneficiary was Egypt's public finances which received US$1758m as a result of its 3G auction in 2007.[39] In contrast, the Communications Commission of Kenya lowered its initial fee of US$25m for a 3G license paid by Safaricom in 2007 to US$10m per license paid by Bharti Airtel and Orange in 2010.

Figure 22: Total 3G spectrum license fees for selected countries (2006-2010, US$ million)[40]



38 A.T. Kearney analysis

39 Both Vodafone and Mobinil paid 3.4bn Egyptian pounds (US$586m) for a 3G license. Etisalat is assumed to have paid the same amount out of the total US$2.9bn paid to enter the Egyptian market including 3G services.

40 Press research (Safaricom are currently claiming a $15m rebate in Kenya based on the reduced prices paid by Bharti Airtel and Orange)

4.5. The role of mobile communications in developing local industries and driving innovation

The mobile Value Added Service (VAS) market in Africa is still relatively immature and dominated by the major mobile operators. Many of the major VAS providers present in the African market are global VAS players such as Comviva, Buongiorno and Naspers. These providers often work directly with operators to develop and operate VAS for each MNO. Nonetheless, NGOs and SMEs are developing innovative standalone applications with potentially substantial financial and social benefits. These range from mobile banking to mobile agriculture applications (see Section 6.1). Currently the VAS market in Africa is in an emergent stage, but with the success of applications such as mobile money (with 8.5m registered M-Pesa users in Kenya), many operators and VAS providers perceive the market to have significant potential.

4.6. Summary

In conclusion, the mobile industry is a major contributor to the economic development of nations across Africa. Beyond its direct contribution, the mobile industry has a powerful ripple effect on other industries within and beyond the mobile ecosystem. It generates significant value add for the economy, creates considerable direct and indirect employment, and contributes to public funding to enable governments to achieve their national development goals. As governments consider policy levers to develop their economies and societies, they must consider the mobile industry as an enabler of development beyond its immediate means. Investing in, and creating the conditions for greater involvement in the mobile industry will drive economic development far beyond its direct domain.

5. Mobile as a driving force for development and innovation

Key Messages:

The cost of mobile ownership has declined to the extent that mobile connections in Africa include users from a wide range of socio-economic groups

At least 36% of Africans within the A25 do not have a mobile connection

In most African countries price-per-minute costs for mobile services are comparable to those in OECD countries

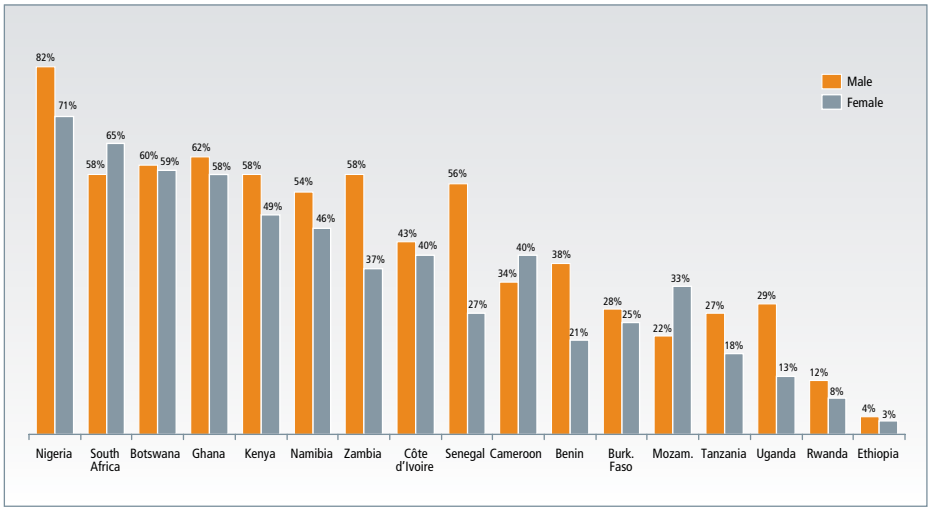
Most African governments have highlighted ICT policy as a key driver for the development of health, education and business

5.1. Distinctive characteristics

Mobile phones are perceived as an essential consumer good and status symbol throughout Africa. Given the poor state of fixed-line infrastructure, in sub-Saharan Africa in particular, mobiles are often the preferred (or only) means of communication. These factors have contributed to the rapid uptake of mobile services across the whole continent. The rapid decrease in prices combined with the broad availability of pre-paid services means that mobile services are accessible to low-income groups. Airtel currently offers a basic handset, SIM card and pre-paid credit voucher for around US$20. Even for those who cannot afford a handset in Africa, it is not uncommon to own a SIM card which they can use in friends' or relatives' phones. As a result, mobile connections now include a range of socio-economic groups, a trend that is expected to continue as mobile service tariffs and handset prices continue to decrease.

A study by Research ICT Africa (see Figure 23) shows how mobile ownership varies by gender. In Zambia, Senegal, Benin and Uganda, there tend to be substantially more male mobile customers. This trend may be attributed to a combination of unequal distribution of income, restrictive social taboos and illiteracy. Interestingly, the inverse holds true in South Africa, Cameroon and Mozambique where there tends to be more female mobile customers than male mobile subscribers.

Figure 23: Percentage with a mobile connection, by gender (2008, % mobile penetration of 16+, selected countries)[41]



The World Bank estimates that in 2010 the rural mobile penetration in Africa was 3%[42]. Unsurprisingly, the majority of mobile customers in Africa live in urban areas, due to the larger disposable incomes and ability to afford mobile services. In addition, ICT related business and occupations are concentrated in cities and towns.

Fundamentally, geographic coverage is another key driver for mobile penetration. Mobile operators have concentrated coverage on the major cities and towns with the highest levels of population density. In the less developed countries, more regular electricity supplies have further played a role in concentrating infrastructure in these urban centres. Nonetheless, for rural communities there are often no alternatives apart from mobile communications. MNOs have responded by expanding coverage into these areas as well as by providing community phones which have a dedicated connection even where coverage is limited.

41 Research ICT Africa (Nigeria and Zambia based on extrapolated data)

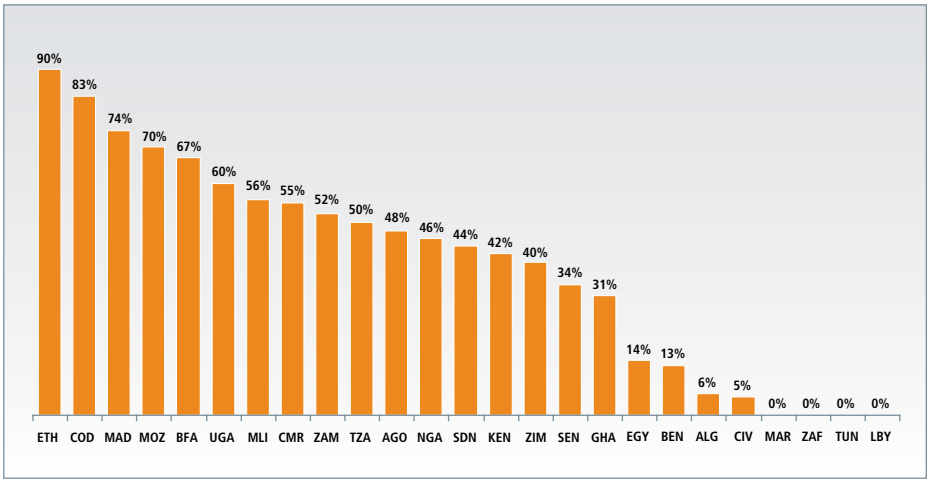
42 World Bank - Africa's Infrastructure - A Time for Transformation

5.2. Importance of mobile connectivity for the unconnected

As we saw in the previous chapter, the mobile industry makes a significant contribution to the economy, employment and government revenues across Africa. We also saw the potential of the mobile industry to facilitate increases in GDP by up to 7.5% as mobile penetration rates increase. By bringing communication technologies to the many unconnected communities, the mobile industry can act as a catalyst for further development and innovation across the continent.

On average 36%[43] of the populations of the A25 countries, currently do not have mobile connectivity (see Figure 24) – a figure which is likely to be much higher in the countries outside the A25. Reaching these people remains a significant challenge, primarily due to coverage requirements and the ultra-low average incomes. The mobile industry is continuing to develop innovative business models and services that will bring communication technology to the 80% of Africa's population with an income of less than $4 per day, and the 60% living on less than $2 per day[44].

Figure 24: Percentage of unconnected population across the A25 countries (2010 Q4)[45]



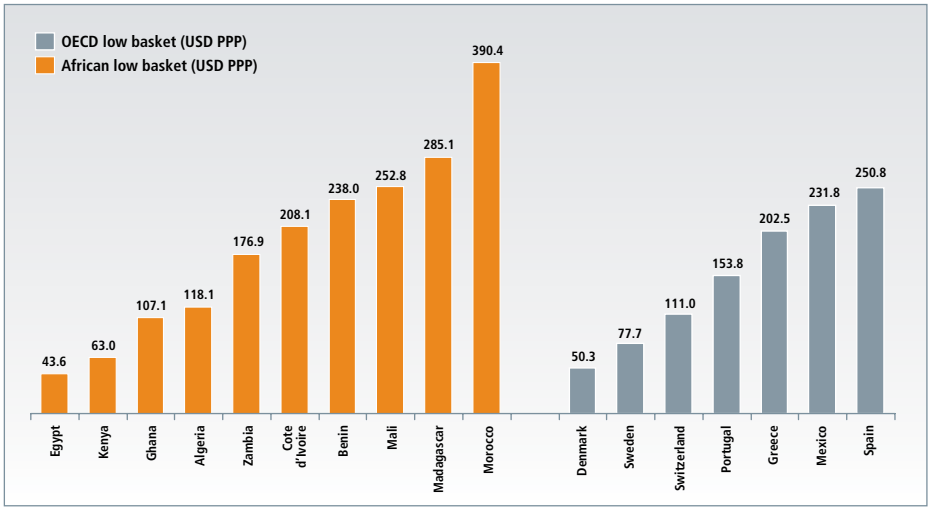
The provision of pre-paid services, which make up 96% of connections in the A25 countries (see Figure 8), allows mobile users to control their expenditures in line with often low and uncertain incomes. Despite the high additional costs of doing business in Africa (which range from high taxation and arbitrary licence amendments to the high additional cost required to run base stations without a reliable electricity supply) when subscribers use their pre-paid service, the average prices are as affordable as in many developed countries. Figure 27 shows a comparison of the OECD price basket for a low-usage case between selected African and OECD countries, on a purchasing-power parity basis. Whilst there are some African countries with comparatively higher costs, mobile services in most African countries are on par with those of the OECD countries.

43 A.T. Kearney analysis – based on a weighted average

44 The Middle of the Pyramid: Dynamics of the Middle Class in Africa, African Development Bank, 2011

45 Wireless Intelligence, A.T. Kearney analysis - based on the difference between the total population and the number of mobile phone SIM subscriptions

Figure 25: Comparison of the cost mobile services in selected Africa25 and OECD countries (US$ PPP)[46]



In addition to pre-paid connections aimed at individual mobile phone usage, the industry has for many years been pioneering the provision of community access to mobile communications. The GSMA has been active in promoting the provision of such community access through the GSMA Development Fund. The Development Fund has created 35,000 Community Phones and 600 internet cafes in increasingly rural locations. These community phones and internet points use shared GSM devices and computers at fixed booths to provide communications to whole communities and employment to local entrepreneurs.

In some cases, such projects are extending the coverage of the mobile networks into previously unserved areas. In South Africa, Connect Africa and Vodacom are working together to bring connectivity to remote areas by boosting the network signal and extending coverage into poorly served areas. These areas will be introduced to the technology and service levels will be expanded as demand is established and grows. By monitoring the activity in each of the communities, mobile operators are able to identify areas where usage is sufficient to justify a fixed network installation. Once Vodacom expands permanent network coverage to these active communities, Connect Africa can move further afield to expose yet more rural areas to mobile communication technology. This mutually rewarding partnership is bringing mobile connectivity to the unconnected, promoting social enterprise and generating a return for mobile operators.

46 Research ICT Africa, OECD Communications Outlook 2009

5.3. How the mobile industry will help governments achieve their ICT development goals

The Millennium Development Goals (MDGs) are a series of time-bound targets with a deadline of 2015. They range from reducing extreme poverty and hunger by half to improving education, health, gender equality and environmental sustainability. As ICT is an essential component in the development of education, healthcare, agriculture and business services, African governments have begun aligning their ICT policy to the MDGs. In 2001, the African Union established the New Partnership for Africa's Development (NEPAD) along with an e-Africa commission. The mandate of the commission includes:

- Accelerating the development of African inter-country, intra-country and global connectivity, and
- Promoting conditions for Africa to be an equal and active participant in the Global Information Society

Governments across Africa have responded by establishing customized ICT strategies to promote the expansion of communications services and to embed it at the heart of development policy. For example, Ghana has positioned ICT as the fundamental building block for its long term development strategy:

> "The Government of Ghana is committed to pursuing an ICT for Accelerated Development (ICT4AD) Vision aimed at improving the quality of life of the people of Ghana by significantly enriching their social, economic and cultural well-being through the rapid development and modernization of the economy and society using information and communication technologies as the main engine for accelerated and sustainable economic and social development."[47]

Mobile operators are primary stakeholders in supporting expansion of ICT across Africa. Mobile operators are investing heavily in mobile network coverage to provide the continent with access to ICT services. Mobile operators are also instrumental in bringing international bandwidth to the continent through submarine fibre-optic cable initiatives such as EASSy which serves the East Coast of Africa consists of 16 shareholders who are predominantly mobile operators. Similarly, a 5,000km national backbone project in South Africa is being jointly funded by Vodacom, MTN and Neotel.

It is clear that to achieve the continent's ICT development goals, African governments and the mobile industry must continue to work together in partnership to bring the benefits of communication technology to the people of Africa.

47 Ghana Ministry of Communications

6. Corporate sustainability: The environmental and social impact

Key Messages:

Mobile operators have driven the emergence of a unique industry in innovative mobile services in Africa enabling and promoting agriculture, banking, education, health and gender equality

86% of NGO employees use mobile phones which are considered an essential tool

Mobile phones can now be used as a mass communication system throughout Africa in the event of emergencies and environmental disasters

The mobile sector now plays a key role in promoting rural access to electricity and sustainable energy

6.1. The social impact of the mobile industry

By 2015, it is predicted that sub-Saharan Africa will have more people with mobile network access than have electricity at home[48]. As mobile service penetration across Africa begins to exceed that of other core infrastructure, the mobile industry is beginning to have an increasingly significant impact on society. As well as improving communication, the mobile phone is facilitating improvements in agriculture, banking, education, healthcare and the empowerment of women.

m-Agri

The International Food Policy Research Institute estimates that 65% of the population in sub-Saharan Africa relies on subsistence farming. Crop yields can be highly variable which can severely strain farmers' ability to feed themselves and their families. One of the key problems is that poor farmers lack access to vital agricultural information, training and advice on topics such as pests, diseases, weather, fertilizers and proven farming practices. Mobile connectivity offers a new opportunity to bridge this gap and to connect the farmer with up-to-date agricultural knowledge.

In Kenya, where 70% of the population is employed in agriculture, the GSMA Development Fund established M-Kilimo[49], a dedicated helpline providing information and advice to small-hold farmers. Typically, the helpline experts dealt with four main topics of enquiry:

- Agricultural tips and efficient farming practices
- Questions on plant and animal diseases and treatment
- Agriculture-specific weather forecasts
- Market price information

Since the dialogue between the farmer and the helpline expert occurs in real time, most problems can be resolved during the call. However, complex queries sometimes need more time and M-Kilimo undertakes to try to resolve these more complicated issues within a 24hr period.

m-Banking

Mobile banking services have been widely publicized as revolutionizing access to financial services to low income groups. In Kenya in 2007, Safaricom's M-Pesa money transfer service was the first to launch. In the first 30 months of service, 8.5m Kenyans registered[50] as M-Pesa users and US$3.7bn worth of transfers were made (approximately 10% of Kenyan GDP). M-Pesa allows users to deposit, transfer and withdraw cash via Safaricom's M-Pesa agents, of which there were 18,000 in April 2010, compared to 491 bank branches. These developments enable subscribers to transfer money to family members, make a payment for goods or services or simply save their money in a more secure form than cash. Money transfer services have since been launched by many other mobile operators in several other countries including: Ghana, Tanzania, Uganda, Nigeria and South Africa.

48 Cisco VNI Forecast February 2011

49 Kilimo means "agriculture" in Swahili

50 Mobile Banking: The impact of M-Pesa in Kenya. Mbiti, I. and Weil, D.N. (2011). National Bureau of Economic Research Working Paper Series.

Since the original launch of M-Pesa, the mobile money industry has continued to develop in many African countries. Today, it has reached a level of sophistication not seen anywhere else in the world. In addition to transaction services, Africans are now able to use mobile banking to access savings accounts, agriculture insurance, pensions, health insurance, micro-finance loans and life insurance products. For example, Safaricom in partnership with The Equity Bank in Kenya provides customers with an M-KESHO account allowing them to save, buy insurance and arrange micro-finance loans all via mobile banking. Similarly, Tigo Ghana's "Life Care" service offers Life Insurance with monthly premiums as low as GHC1 (€0.54).

Studies have shown that in addition to providing greater stability to low income groups, mobile banking often acts as an entry to more formal banking services. Mbiti and Weil show that the introduction of M-Pesa has led to a 58% increase in the number of Kenyans who have bank accounts. Therefore, not only do these innovative mobile services provide an immediate service to the poor, but they act as a catalyst to the on-going development in the wider economy.

In 2009, the GSMA launched the Mobile Money for the Unbanked (MMU) programme, aimed at accelerating the provision of money services to those living on less than $2 per day. Supported by a grant from the Bill & Melinda Gates Foundation, MMU has the goal of reaching 20 million people by 2012 and ultimately to make mobile money a mainstream business.

m-Learning

Education is widely regarded as the best long-term tool to improve the standards of living for the poor. M-learning initiatives facilitate education and learning in even the most remote locations, and provide a supplement to bricks-and-mortar schools in areas where schools are sparse and access to education is limited. Low income groups' access to education is restricted by many factors including: the cost of education and expectations that children may undertake child employment, as well as language and social barriers.

M-learning offers a solution to several of these key challenges. It is inclusive and non-discriminatory, it can be accessed from wherever the user wishes to learn, can be tailored to individual learning needs and can progress at each users' own pace, while fitting around income generating activities. M-learning can also help to overcome the gender inequality in many developing countries, by providing women with a safe learning environment without leaving the household or community.

In addition to providing general education, m-learning is also providing valuable support to professionals in on-the-job training. Community Health Workers (CHW) in the UN's Millennium Villages in Uganda, Rwanda and Kenya have access to m-learning modules on their mobile phones. Information on reproductive health and care for new-borns are two of the subjects CHWs can download from a central database to their mobile phone. Mobile networks provide the privacy, quality of service and interoperability required to deliver this learning application, to improve the lives of the communities that the CHWs serve.

m-Health

Sub-Saharan Africa has the lowest average life expectancy of any region in the world at 52 years. In Lesotho, it is only 46 years[51]. In this context, access to appropriate, quality healthcare remains a major challenge to improving the standard of living for Africa's population.

Mobile technology is emerging as an important tool to improve the delivery of healthcare across Africa and is currently being used in a number of areas:

- Capturing and analysing data for disease surveillance
- Providing remote diagnoses via telemedicine
- Supporting community health workers in gathering and managing health information
- Improving access to health education, information and resources through health hotlines
- Coordinating drug and medical supply distribution

In Rwanda, MTN, Voxiva and the GSMA Development Fund have deployed a system to enable healthcare workers in the field to use mobile phones to collect data related to outbreak of contagious disease, numbers of patients, drug stocks etc. The use of mobile technology means that this information is available, and can be acted upon in real time, rather than the traditional paper-based systems which can cause errors, inefficiency, and delay.

In Ghana and Nigeria, systems have been deployed to allow users to check the authenticity of pharmaceuticals. Counterfeit drugs are a major issue in Africa and the scheme, endorsed by the West Africa Health Organization, is being promoted by a number of drug companies. GlaxoSmithKline is one of the recent pharmaceutical firms to sign up to the initiative; which enable users to send a code printed on the drug packet via SMS and receive a reply, either verifying the authenticity of the drugs or giving a warning that the product may be fake and providing a helpline number to call for advice.

m-Women

The GSMA Development Fund formed the mWomen programme after identifying a sizeable gender gap in mobile phone ownership in middle and lower income countries. Across Africa, women are on average 23% less likely to own a mobile phone than men, meaning that women are missing out on many of the social and economic benefits that mobile connectivity brings. A recent survey of female mobile phone users in lower and middle income countries[52] showed that 93% of women say they felt safer and more connected to friends and family with a mobile phone, whereas 85% felt more independent. 41% of women reported an increase in earnings or professional opportunities due to owning a mobile phone, a figure which rises to 55% among female business owners.

In Liberia, MTN recognised that women in the market were underserved52 and only required regular contact with a small circle of family and friends. MTN developed new tariff plans for the "Her & Home" segment offering discounted calling during relevant times of day and preferential rates for a selected group of friends and family. The marketing of these services were also designed to appeal to the needs of women to encourage uptake.

51 UN Human Development Report 2010

52 Women and Mobile: A Global Opportunity, GSMA Development Fund

6.2. Role of NGOs

Non-governmental organisations (NGOs) continue to play an important role in many parts of Africa to aid development and to provide healthcare, educational, environmental and humanitarian support. Mobile technologies are enabling these organisations to deliver their services more efficiently and enabling resources to be more rapidly allocated to those with the greatest need.

A survey by the UN Foundation and the Vodafone Group Foundation found that 86% of NGO employees use mobile technology to support their work[53]. The survey listed the benefits of mobile technology for NGOs as follows: time savings (95%); the ability to mobilize or organise individuals (91%); reaching audiences that were previously difficult or impossible to reach (74%); the ability to transmit data more quickly and accurately (67%); and the ability to gather data more quickly and accurately (59%).

NGO uses for mobile technology range from the Tunisian Red Cross providing mobile phones to allow people fleeing the recent conflict in Libya to call their loved ones; to Cell-life in South Africa providing HIV / AIDS outpatient services.

In Kenya, mobile operators, NGOs and the GSMA Development Fund are working together to plant trees under a project helping to reverse the devastating effects of deforestation and drought. The project provides an income to local Africans who use hand held mobile devices to accurately collect tree location and growth information, the information is sent via the mobile network to the project head office in the US.

6.3. Role of mobile technology in disaster preparedness and relief

Mobile technology is providing new ways for governments and NGOs to cope with natural and man-made emergencies and disasters. From providing communications infrastructure when all other infrastructure has been destroyed or damaged to mobilizing charitable donations, mobile technology is playing key role in coordinating responses to and pre-empting emergencies.

In July 2011, following the most acute drought in east Africa in 60 years, Kenyans donated nearly US$200,000 in aid for drought victims via SMS within the first 12 hours of the appeal. The appeal went on to raise US$5m in the first four weeks, reaching an eventual total of US$10m. The money was administered by the Kenyan Red Cross to help those worst affected by the drought. Including more than four million Kenyans, many of them small-hold farmers in the north, threatened by mass starvation.

In December 2004, the waves of the infamous Indian Ocean tsunami struck the coast of Tanzania. At the time, very few of the many fishing boats working along the coast had radios and the only means of communication was via mobile phone. Miraculously, there were only 13 fatalities along the entire Tanzanian coast. Since then, the Tanzanian Red Cross has been supporting the UN funded Indian Ocean Tsunami Early Warning System. In addition to broadcast radio sets, badly needed early-warning equipment has also been distributed in the form of mobile phones, bicycles and megaphones.

Zain and the GSMA Development Fund have been supporting efforts to pre-empt emergency situations and improve response rates. Each year up to 5,000 people die from accidents and piracy in Lake Victoria's fishing zones. In 2008, an additional 21 radio sites were built to provide mobile coverage up to 20 kilometres into the lake. This initiative was intended to drive further economic and social development within the lakeside communities and reduce the number of fishing-related deaths each year. The initiative uses Ericsson's Extended Range software package to more than double the effective range of radio base stations and a location-based service that enables emergency authorities to triangulate the mobile signal of fishermen in distress.

53 Wireless Technology for Social Change: Trends in Mobile Use by NGOs 2008, UN Foundation and Vodafone Group Foundation

6.4. The environmental impact of the mobile industry

Mitigating climate change is an unprecedented challenge for the world: a challenge where consumers, companies, NGOs and governments each have an important role to play. Whilst the mobile industry is not a major emitter of carbon-dioxide or other greenhouse gases in comparison to some other industries, it is nonetheless taking an increasingly important role in mitigating the effects of climate change.

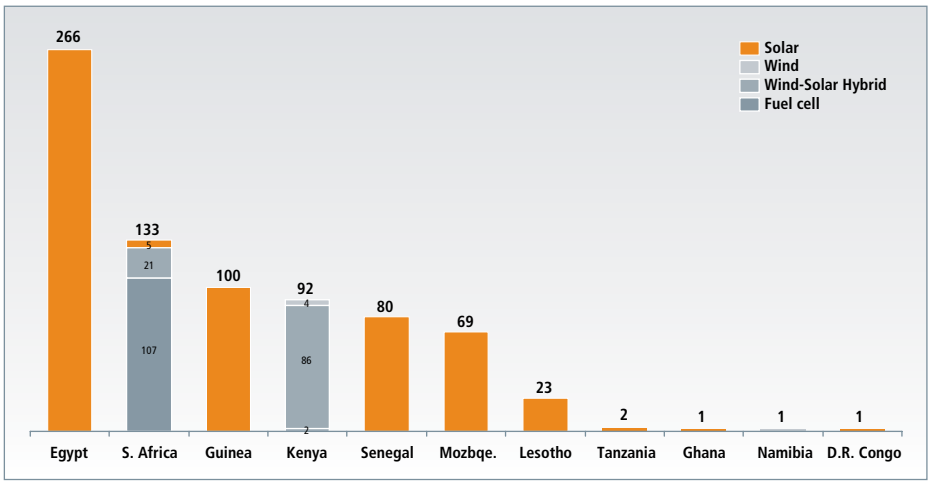
In the African context, the question of energy consumption takes on an additional dimension since much of the continent is without reliable energy production and distribution. Estimates indicate that only 8% of the rural population in sub-Saharan Africa has access to electricity, compared to 53% in urban areas[54].

Mobile operators and vendors are finding innovative ways to increase energy efficiency and reduce the greenhouse gas emissions resulting from the operation of mobile networks and charging of mobile devices. Improving the energy efficiency of the mobile industry can be achieved broadly in the following ways:

- Designing low energy base station sites
- Deploying base-stations powered by renewable energy
- Implementing infrastructure optimisation and sharing
- Reducing mobile device life cycle emissions through design and recycling

According to GSMA research, by 2012, there are expected to be around 165,000 base stations across sub-Saharan Africa which do not have a reliable electricity supply. This is around 79% of all base stations in sub-Saharan Africa[55]. Such base stations are typically powered by diesel generators. Reducing this dependence on diesel is a huge challenge, but mobile operators are making progress to convert to renewable energy sources. For some time, mobile operators in Africa have been powering base stations, utilising solar, wind and fuel cells as alternative energy sources. Across all of Africa, solar power is the most common form of alternative energy used, powering nearly 550 base stations. In Egypt alone, 266 base stations are solar-powered between Vodafone (166) and Mobinil (100), with a further 250 in Guinea, Senegal and Mozambique. Safaricom and Telkom in Kenya are combining wind and solar approaches to power 86 base stations. Another approach, being pioneered by Vodacom South Africa, is the use of hydrogen fuel cells. When the power supply fails, the fuel cell uses stored hydrogen to generate electricity without harmful emissions, and only water as a by-product.

Figure 26: Base Stations Powered by Alternative Renewable Energy Sources[56]



54 Davidson, O., Chenene, M., Kituyi, E., Nkomo, J., Turner, C., and Sebitosi, B. (2006) - Sustainable Energy in sub-Saharan Africa

55 Community Power: Using Mobile to Extend the Grid. GSMA, 2010

56 Source: GSMA

Beyond powering the mobile network, mobile operators also see the great potential of their energy infrastructure to deliver surplus energy to local communities. Mobile operators are able to provide the excess power generated to the local communities for lighting, mobile device charging, water pumping. Safaricom, Kenya's largest mobile operator has provided diesel, solar, and wind powered infrastructure for multiple Community Power applications at more than 15 of its off-grid sites in Kenya. Table 1 provides an overview of the community power applications available at these off-grid sites across Kenya.

Table 1: Examples of community power sites in Kenya[57]

Site	Location	Community Power Applications
Tegea	250 km North-West of Nairobi	Mobile phone charging booth Market street lighting Lighting and socket power to local community church Lighting and socket power to the site landlord and the local provincial administration (chief's house)
Faza Island	15 km South of Saadani, North Kenya Coast	Mobile phone charging booth Supply of power to local community school computer room
Chesengoch	220 km North of Nakuru	Mobile phone charging booth Lighting and socket power to mission hospital maternity wing Market street lighting Lighting and socket power to local community library
Archer's Post	600 km North of Nairobi	Power to local community water pumping system
Konyao	Near the Kenya-Uganda border	Mobile phone charging booth Lighting and socket power to a local community school
Kiunga Sankuri	450 km North of Mombasa on the east coast, near the Kenya-Somalia border	Mobile phone charging booth Power to local community radio
Ndau Island, Laisamis, Nyagoko, Tot, Rhamu, Sololo, Loiyangalani	Across Kenya	Mobile phone charging booths

The GSMA estimates that across East Africa, there is the potential for 11,000 community power projects bringing the combined benefits of communication and electricity to rural populations. Access to these facilities will in turn promote improvements in education, health and quality of life for many low-income groups.

In conclusion, while it is clear that the provision of mobile communications to the poor in Africa will not alone eradicate poverty, there are huge strides being made to help the least well-off in society. The proliferation of mobile communications is also is improving access to financial services, education and healthcare, and is supporting emergency relief, social equality, and even electricity distribution.

In the next chapters we will turn to look at the regulatory environment in which the mobile industry is operating in Africa, the investments which mobile operators are making and what more might be done to enable the mobile industry to continue to drive social and economic development.

57 Source: Safaricom

7. Spectrum and technology availability

Key Messages:

African countries allocated considerably less spectrum to mobile services than developed and developing countries in Europe, the Americas and Asia.

To enable the mobile industry to continue to act as a catalyst for growth, sufficient spectrum is needed for the provision of mobile broadband services through 3G and 4G technologies

Allocating the Digital Dividend spectrum to mobile services will enable the mobile industry to accelerate their efforts to bring connectivity to the large numbers of unconnected Africans

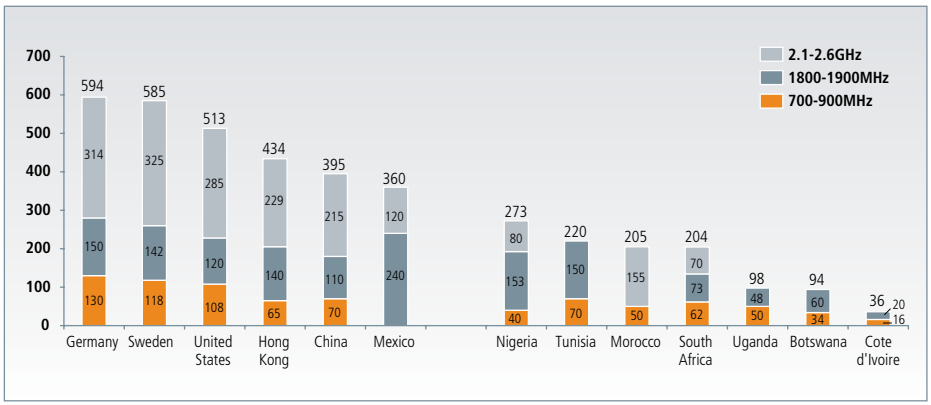
Governments in the region must establish clear guidelines for spectrum planning, licensing, pricing and re-farming.

African governments must clarify spectrum availability of both the coverage bands (700, 800, and 900 MHz bands) and the capacity bands (1800, 2100, 2300, 2600, and 3500 MHz bands).

7.1. Access to spectrum

Compared with Europe, North/Central America and parts of Asia, African countries have released less spectrum to provide public mobile services. For example, in Morocco and South Africa, less than 210MHz of spectrum has been released to mobile. Only in Nigeria has more than 250MHz been released.

Figure 27: Spectrum licensed in selected African and non-African countries[58]



To enable the continued deployment mobile broadband service across the continent, a substantial amount of additional spectrum will be required. This is needed due to the significant increase in data traffic created by these services. A typical smartphone generates 24 times the data traffic, and an average computer generates 515 times the data traffic of a basic feature phone[59]. Mobile data traffic is doubling every year with operators seeing rapid acceptance and uptake by consumers. Whilst the volume of traffic is growing rapidly, the available spectrum to support this traffic has been fixed in many countries – risking a reducing in service as networks reach capacity.

As we have seen in previous chapters, mobile services play a relatively large role in the total broadband provision in Africa because of the underdeveloped fixed access networks. Therefore the availability of adequate spectrum is necessary to meet the ambitious targets for economic and social development and government ICT goals. As a result, African regulators began licensing 3G spectrum to enable operators to meet the ever increasing demand. Since 2006 at least 29 countries have issued 3G licenses with more 3G licence awards in progress during the second half of 2011[60].

In addition to the quantity, the type of spectrum released is also important; a considered selection of the right band to be released will help to drive universal access to mobile broadband. Of particular importance is having a clear plan of what to do with the Digital Dividend[61] (spectrum currently used for analogue broadcast television). If allocated to mobile services, the Digital Dividend spectrum would allow for extensive coverage in rural areas, contributing to a reduction in the digital divide and to connecting the unconnected.

58 GSMA, National regulators

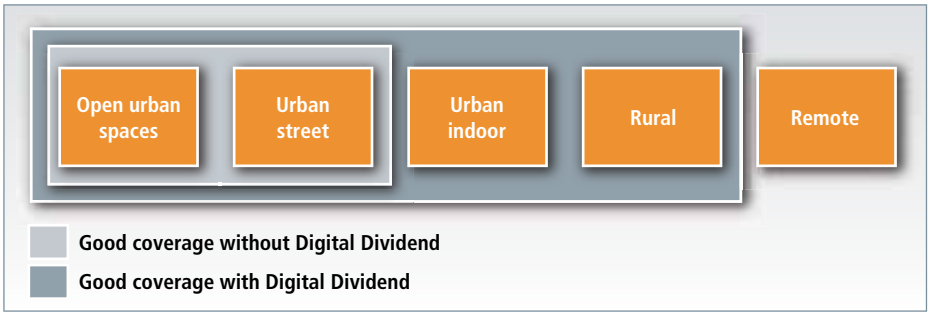
59 Cisco - Cisco Visual Networking Index: Global Mobile Data

60 Informa - Global 3G and 4G Deployment Status

61 Digital Dividend refers to the spectrum released in the process of the transition from analogue to digital television

The applicability for mobile broadband is twofold. Firstly, coverage in rural areas requires low frequency bands. This is in contrast to densely populated areas, which with high levels of traffic would need bands such as 2.3GHz, 2.5-2.69GHz, and 3.5GHz.

Figure 28: Mobile broadband coverage with Digital Dividend[62]



Secondly, the cost of providing coverage to a given area using the 800MHz band can be significantly less than in the 2100MHz band. Therefore, allocating additional spectrum in the 800MHz band to mobile services could reduce the costs of network deployments to a third of the cost of a 2100MHz deployment.

Allocating the Digital Dividend spectrum is being actively discussed by governments in many African countries. Target dates for analogue-to-digital switch-over range from June 2012 in Kenya and Nigeria, to December 2013 in South Africa and 2015 in Egypt. South Africa has agreed to CRASA's[62] recommendation that the 790-862MHz band should be allocated to mobile services in the South African Development Community (SADC) region. However, governments in other countries are less clear on the use of the Digital Dividend. The Egyptian and Nigerian governments had originally favoured the 698-806MHz band for the Digital Dividend.

Regulators should also consider the wider regional and global implications when considering spectrum allocation. Harmonization is a key factor in promoting adoption and can bring other benefits such as cost effective roll-out of networks and devices, a reduction in cross-border interference can also facilitate international roaming. Meanwhile, if harmonization is not achieved there will be an adverse effect on the technical and economic efficiency of any future rollout.

62 Communication Regulators' Association of Southern Africa

In addition to mobile mainstream UMTS (e.g. HSPA and LTE) , Africa has the largest number of national WiMAX networks in the world, with 117 networks deployed in 43 countries having deployed WiMAX as of May 2011 (compared to just 33 in Latin America and 23 in Asia Pacific). . Spectrum required for WiMAX varies due to a number of factors (data rates, deployment environment, time or frequency division duplex) but typically 10MHz TDD (shared between downlink and uplink) is required.[63]

In the past, African regulators have allocated a substantial amount of spectrum to WiMAX – often in a fragmented way (for example, there are approximately 15 players in Tanzania) and with few obligations to launch a service. Worldwide there are only 25 million connections on WiMAX networks, of which around 5 million are in Africa[64]. The low uptake has not helped created the economies of scale needed to make the end devices affordable. These factors have led to valuable spectrum being tied up by small operators who in many cases have not launched services.

Regulators across Africa must carefully assess which services are most likely to actually bring the benefits of mobile communications to their citizens when assigning spectrum to different technologies and individual organisations. It is crucial that a balance is struck between encouraging competition by licensing multiple firms to offer services, and the need for each competitor to have the return on investment incentive to launch services which will benefit the maximum number of people. Spectrum is a valuable resource and should be carefully managed to bring the maximum benefit to the people of Africa.

The GSMA supports a technology neutral approach to the use of all existing mobile bands; governments in Africa should allow deployment of mobile technologies that can technically co-exist according to what are relevant internationally harmonised bands for their region.

7.2. Spectrum pricing

As shown in section 4.4, prices paid for 3G spectrum across Africa have varied considerably from almost $1.8bn in Egypt to $45m in Kenya. On a price per MHz per population basis, Egypt's spectrum is still 18 times more expensive than Kenya at $0.37/MHz/population versus $0.02/MHz/population in Kenya[65]. Clearly governments have some degree of discretion on the pricing of spectrum licenses and there are good reasons for governments to carefully consider the price and quantity of spectrum offered for sale.

A higher net license fee may appear to be in the best interests of the population since the higher government income can be spent to provide services to the people. However, operators bidding for spectrum will always be doing so on commercial grounds. High spectrum fees may dissuade operators from bidding for spectrum, investing in rural coverage, or may result in higher prices for consumers – both of which would limit the possible benefits to consumers from the expansion of mobile services.

Governments need to carefully consider the trade-off between maximizing up-front revenues with the wider societal benefit of mobile operators investing in coverage, capacity, and new services.

63 WiMAX forum

64 WiMAX forum

65 Calculated based on 2007 populations

7.3. Importance of clear roadmap of spectrum allocation

Spectrum management is among the most important issues for the telecoms industry globally. Spectrum is a limited resource that governments control and need to best utilise to maximise economic and social benefits for their citizens. As shown in previous chapters, mobile service is the primary means of communication for much of the population in Africa and mobile broadband is expected to be the critical technology that will finally bridge the digital divide and connect the unconnected masses. However, for ubiquitous and seamless mobile communications and broadband to exist, sufficient spectrum must be allocated to the industry. To provide the desired mobile services at the lowest possible cost and to allow consumers to use the widest selection and low cost handsets, the mobile industry needs to be allocated harmonized frequency in internationally standardized band plans. The licensing and spectrum landscape across Africa differs to a certain extent along the lines of emerging and developed economies. In most developed markets, 3G spectrum licences have been available in the market for a number of years already. In such markets, the uptake of 3G and the corresponding rapid increase in data traffic, is putting pressure on the bandwidth available for operators to meet the needs of customers. In many African markets, 3G licences have only recently been issued (e.g. Tunisia, Togo, Somalia) or will be issued by early 2012 (Algeria, Gabon).

Governments should design and implement spectrum award procedures in an efficient, technology neutral and transparent manner to keep participant costs low and deliver benefits to citizens as quickly as possible. Lack of clarity around the spectrum award procedures can send mixed (and even negative) signals about the investment climate in a country. In 2010, Mobitel won a dispute in the Nigerian Federal high court, overruling a decision by the Nigerian Communications Commission (NCC) to cancel Mobitel's spectrum licensing within the 2.3GHz band.

Government policies should aim to develop a technology neutral environment (while ensuring interference is managed and allowing the deployment of internationally harmonised spectrum plans). To facilitate innovation and a smooth technology development curve, governments should relax restrictions on the specific technology to be deployed so that, for example, a GSM operator can consider using its current spectrum allocation for upgrading to 3G technology (UMTS/HSPA) or even fourth generation technology (LTE). One might consider this as allowing operators to follow a natural upgrade path, ensuring that they are using the most cost-effective and spectrally-efficient solutions.

Government policies should also be fair to all industry players. Implementing policies with the aim of ensuring one player (typically the state-owned incumbent) has an advantage of going to market well before others, does not create a level playing field. For example, the eligibility criteria announced in September 2011 for Kenyan's 4G licenses appears to favour two of the four Kenyan operators by requiring at least 20% national ownership in order to apply.

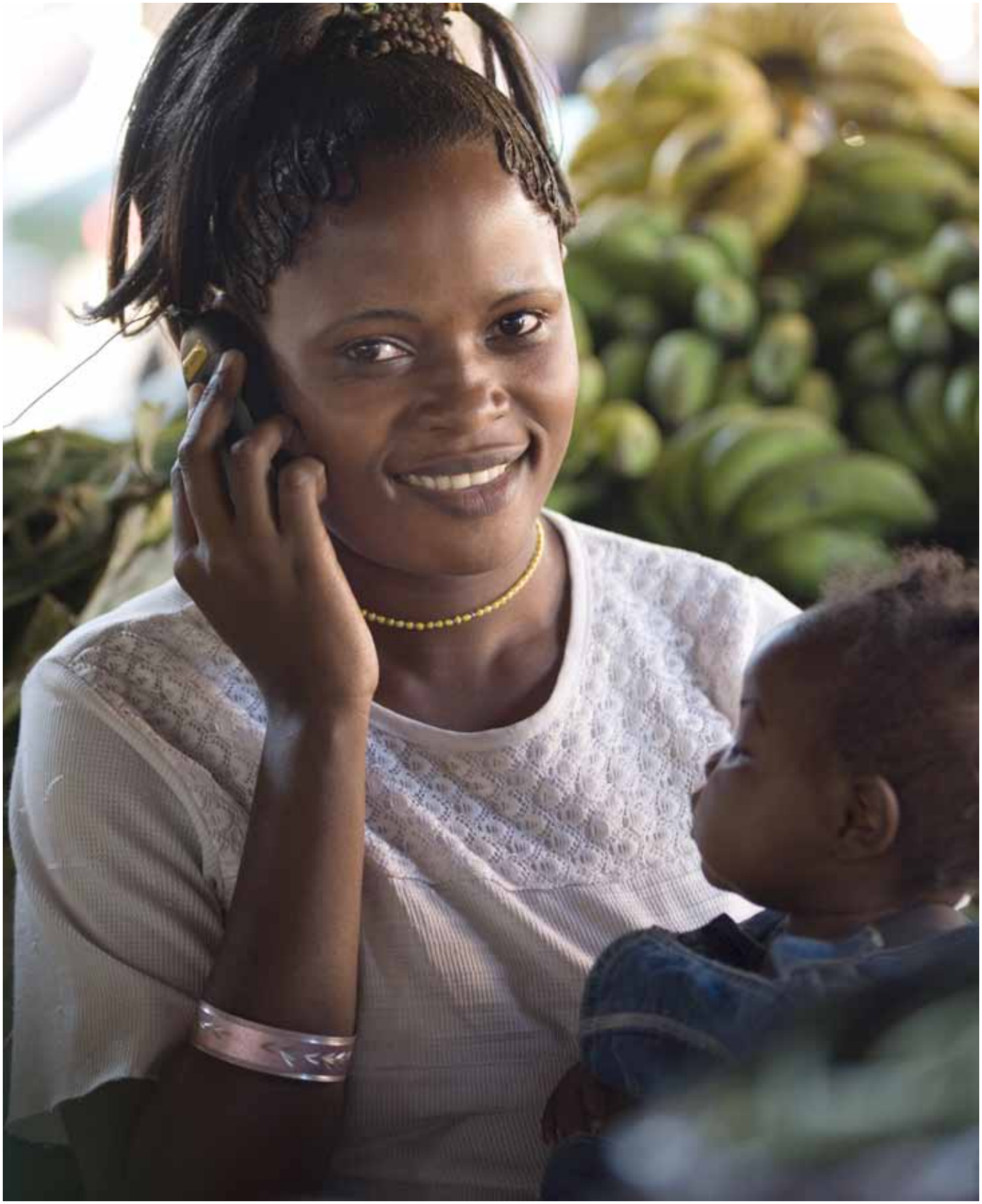
A similar situation has arisen in South Africa in 2011. The sale of spectrum in the 2.6GHz band has been delayed due to concerns from operators over the conditions that bidders must have 30% equity owned by "Historically Disadvantaged Individuals". While it is entirely reasonable for states to require certain levels of local ownership, empowering the local population through access to mobile connectivity should be of primary consideration for policy makers.

Finally, preparing for spectrum awards and implementing award procedures should be carried out transparently and preparations should include public consultations with market players. Investments in spectrum have long lead-times and thus require a high degree of certainty. Governments should realise that there are many ways to promote investment and attract bidders, for example:

- Governments in the region must establish clear guidelines for spectrum planning, licensing, pricing and re-farming.
- Clarify future spectrum availability of both the coverage bands (700, 800, and 900 MHz bands) and the capacity bands (1800, 2100, 2300, 2600, and 3500 MHz bands).
- Allow deployment of mobile technologies that can technically co-exist according to what are relevant internationally harmonised bands for their region.

As countries across Africa begin to consider relaxing restrictions on the deployment of HSPA and LTE service in the "GSM bands" transparency and public consultation will become increasingly important. To this end, the Communication Regulators' Association of Southern Africa (CRASA) which represents the national regulators in Southern Africa is working to harmonise its ICT policy including establishing clear guidelines for spectrum planning, licensing, pricing and refarming.

Clearly, spectrum is fundamentally important for the success of the mobile industry. In economic terms it is an essential input; no spectrum means no networks, and no services. Providing connectivity to all citizens cannot happen without ensuring the mobile industry receives a sufficient amount of spectrum for both coverage and capacity. As such, regulators are strongly encouraged to adopt the recommendations made above to license sufficient spectrum in the necessary frequency bands, priced to maximize the socio economic benefits for their respective societies.



8. Infrastructure investment

Key Messages:

Mobile operators invested over $54bn in infrastructure between 2000 and 2008 to deploy GSM networks in sub-Saharan Africa alone

These investments have brought mobile coverage to two-thirds of the African population

The deployment of 3G networks is on-going in many countries and will require substantial additional infrastructure investments from the mobile industry

The current state of transport and power infrastructure across Africa continues to hinder regional development, investment, and the capacity of the mobile industry to connect the unconnected

8.1. Investment in infrastructure

Between 2000 and 2008, mobile operators invested US$54bn in new infrastructure across sub-Saharan Africa alone (with additional investment in North Africa where mobile coverage is some of the highest in the continent). During this period, many operators across Africa deployed their 2G networks, investing around US$10bn per year to provide coverage to two-thirds of the African population (see Figure 29). Over the next 5 years, one operator alone plans to invest around US$1.8bn to deploy their new LTE network.

Figure 29: Total infrastructure investment by mobile operators in sub-Saharan Africa (US$ billion)[66]

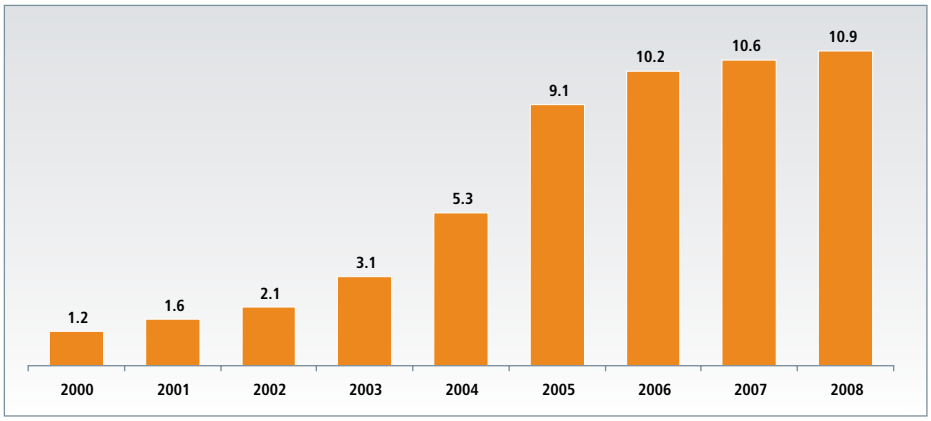
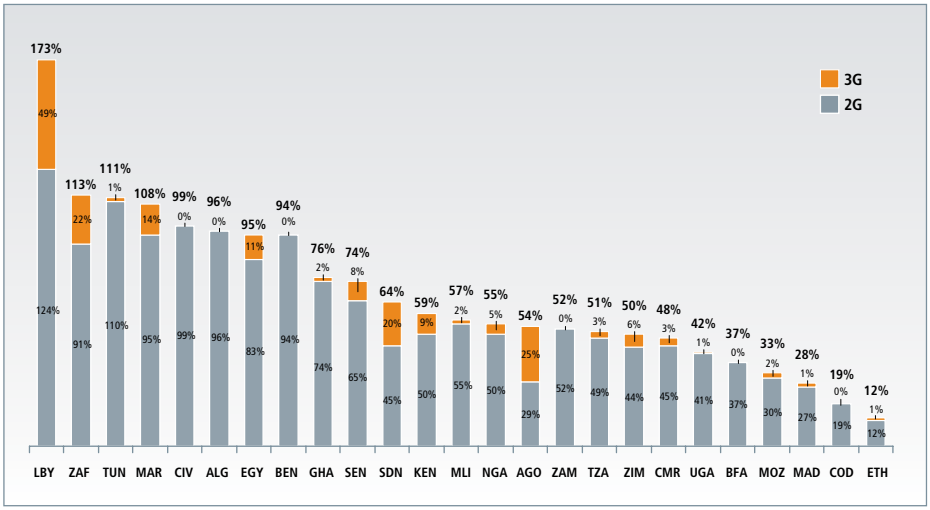


Figure 30 highlights the extent to which the mobile industry has invested in Africa, 8 countries in the A25 have deployed extensive GSM networks such that over 90% of the population have mobile coverage. However, the figure also highlights the extent of the work required to extend coverage to the large percentage of unconnected population in many states. While many countries have increased population coverage over the past decade to 50% or greater, there are still some countries, such as Ethiopia, where coverage remains confined to the major cities.

As discussed in the previous chapter, the deployment of 3G mobile infrastructure is on-going across the continent with the highest penetration at 49% in South Africa. 3G services currently cover 52% of the population in South Africa and are expected to reach 85% of the population by 2013. In many cases, delivering 3G services requires significant investment in network infrastructure in addition to the purchase of a 3G license. In some cases, due to endemic delays in the licensing process, mobile operators face difficult choices about when to actually begin necessary network investment. For example, Zain Malawi received a 3G license from the Malawi Communications Regulatory Authority in 2009 following 3 years of dialogue. By this time, Zain had almost completed the deployment of its 3G network infrastructure and was able to launch it service less than a year later.

66 GSMA estimates

Figure 30: 3G & 2G Penetration in A25 countries (Q2 2011)[67]



8.2. Impact of public infrastructure weakness

Across Africa the state of public infrastructure varies widely; from central Cape Town, with every amenity of a European capital or North American city, to vast rural areas of desert and scrubland, inhabited by subsistence farmers and herdsmen. Only 65% of Africans have access to safe drinking water (varying from 99% in Egypt and Mauritius, to 30% in Somalia). During 2007, Africa generated a total of 619TWh of electricity, sufficient only for each person living in the continent to run a single 60W light bulb for 11 hours during the year[68]. These limitations represent significant challenges to the further development of the region and to the mobile industry in serving its customers.

According to a recent report for the GSMA,[69] Nigeria produces only enough energy to meet 10% of its daily power requirements and only 40% of Nigerians are connected to the national grid.

As a result of this limited power supply, mobile operators are forced to explore alternative energy sources including the use of generators at every base station. In Nigeria, where generators work for up to 22 hours a day, two generators (costing in total ~US$40,000) are typically used per mobile base station. The use of diesel generators to power the mobile infrastructure is a significant cost to the industry. In Nigeria the cost to run a base station can be as high as US$2,000 per month compared to US$429 per month in India. In more energy reliable markets such as Ghana, Kenya and Tanzania, the cost can be about half that in Nigeria.

Section 6.4 provides an overview of how mobile operators are attempting to tackle these infrastructure issues by introducing solar and wind powered base stations and providing excess power to the local communities who live around base stations.

8.3. Limitations to expanding infrastructure

Infrastructure network sharing is a common practice in developed markets in order to reduce capital expenditure and operating costs through maximising economies of scale. In Europe, extensive network sharing by some operators is estimated to deliver a cost advantage of up to 59%[70]. The African mobile sector is still at a relatively nascent stage, with network sharing limited to only a handful of countries including South Africa, Nigeria and Ghana. However, network sharing has the potential to significantly reduce the costs of infrastructure investments in some low penetration markets. For example, the Democratic Republic of Congo has a penetration rate of only 17% with 5 mobile operators. Network sharing would enable the operators to expand coverage and increase penetration, while substantially reducing their respective investment and operating costs.

67 Wireless Intelligence

68 Source: Africa Development Bank Statistical Year book 2011 - 619TWh (619 billion kWh) energy production in 2007 divided by the 2007 population of 963 million provides 640Wh per person which is enough energy to power a 60W load for 10.66hours.

69 Source: Assessment of the economic impact of wireless broadband in Nigeria

70 A.T. Kearney - '1+1=1: Network Sharing', 2009

9. Regulatory enablers to spur further growth

Key Messages:

Regulation practices have recently improved in Africa, but 64% of African countries remain in the bottom quartile in the World Economic Forum's political/regulatory index

GSMA research indicates that the total tax intake by governments in Africa could be boosted by reducing the tax rates on the mobile sector

Universal access has been promoted by most African governments using taxation schemes, but there is limited transparency around the redistribution of funds

9.1. The need for transparent, predictable and consultative regulatory regimes

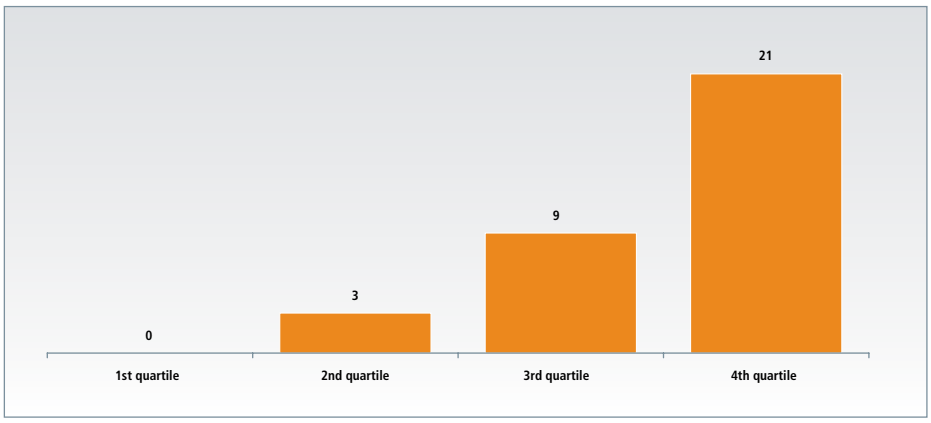
A chief concern of operators globally, is that the regulatory regime in which they operate should be transparent, predictable and consultative. When making investments, operators seek to avoid regimes exhibiting poor transparency, favouritism, opaque foreign ownership rules, or inefficient legal processes.

Decisions made by regulators or other policy makers can potentially change the business case for long-term investment at short notice. Mobile operators are currently considering investing significant funds into licences and the development of LTE infrastructure. In deciding where and how much to invest, the level of transparency and predictability in the regulatory regime are clearly important decision criteria.

The World Economic Forum and INSEAD's annual Networked Readiness Index evaluates and ranks the political and regulatory environment of countries around the world. The ranking considers factors such as: the effectiveness of law-making bodies, ICT-related laws and the speed and process to enforce contracts.

Figure 31 and Table 2 shows that 64% of African countries evaluated were ranked in the bottom quartile of the index of 138 countries. Africa had no countries ranked in the 1st quartile, 10% in the 2nd quartile and 27% in the 3rd quartile. On a country level, rankings (out of 138) ranged from the 3 African countries in the 2nd quartile: Tunisia, Mauritius and South Africa ranked 35th, 47th and 61st respectively, to Burundi and Chad at the very bottom of the rankings at 137th and 138th. Those at the bottom of the index share several features: overregulated markets, inefficient political frameworks, poor educational and research systems, and low mobile and internet penetration rates.

Figure 31: Distribution of African countries in Global Network Readiness Index (2010-11)[71]



71 World Economic Forum & INSEAD - The Networked Readiness Index 2010-2011

Table 2: Network Readiness Index ranking for selected African countries (2010-11)[72]

Country	Africa rank	Global rank	Country	Africa rank	Global rank
Tunisia	1	35	Benin	18	114
Mauritius	2	47	Algeria	19	117
South Africa	3	61	Tanzania	20	118
Egypt	4	74	Mali	21	120
Senegal	5	80	Lesotho	22	121
Kenya	6	81	Burkina Faso	23	122
Namibia	7	82	Ethiopia	24	123
Morocco	8	83	Cameroon	25	125
Cape Verde	9	84	Libya	26	126
Botswana	10	91	Madagascar	27	129
Ghana	11	99	Mauritania	28	130
Zambia	12	102	Zimbabwe	29	132
Nigeria	13	104	Angola	30	133
Malawi	14	105	Swaziland	31	134
Mozambique	15	106	Burundi	32	137
Uganda	16	107	Chad	33	138
Cote d'Ivoire	17	113			

The stability and predictability of the political and regulatory environment is important for the telecom industry for a number of reasons:

- The lack of consistency, transparency and industry inclusion in the regulatory process can stifle competition in the mobile industry and reduce the level of trust among stakeholders
- Uncertainty in the regulatory regime and lack of a clear long-term path for the industry's development increases the risk profile and can worsen the overall investment climate

In order to ensure a thriving telecoms sector that maximises the benefits for society; governments and regulators should adopt the following principles and practices:

- Major regulatory decisions (such as spectrum allocation and licensing) should be made in a transparent, inclusive and consultative manner drawing inputs and feedback from all industry stakeholders
- Regulatory policy should be based on sound and efficient legal system that enable timely contract enforcement, adequate appeal processes and effective implementation

9.2. Reducing ineffective taxation to drive penetration

As we have seen in earlier chapters in this report, the mobile industry makes a significant contribution to economic growth and development across Africa. As countries emerge from the global economic downturn, government taxation policy will have a strong influence on the mobile industries ability to contribute to economic growth. Today, mobile operators face a variety of industry-specific surcharges such as licence fees, spectrum usage charges, services taxes, USFs etc. In addition, a number of African countries also employ mobile sector specific charges e.g. specific excise duties ("luxury taxes") on mobile handsets, luxury taxes on mobile usage/airtime, luxury taxes on ICT equipment, SIM activation charges and surtaxes on international incoming traffic, to name but a few.

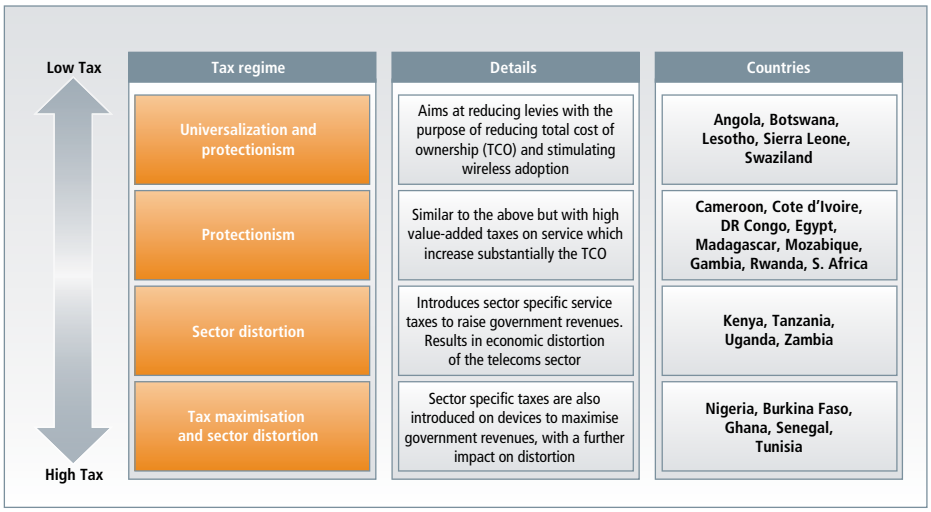
In sub-Saharan Africa, 12 governments levy luxury taxes on air time and 13 governments levy over 30% tax on handsets. Gabon charges 80% tax on handsets including $5 special tax at the point of purchase, plus 30% import duty and 18% VAT. Niger levies a tax of 66% and Cameroon 49% on handsets including import duty and VAT. Gabon charges 36% tax on airtime purchases comprised of 18% standard VAT plus an additional 18% airtime specific tax[73].

72 World Economic Forum & INSEAD - The Networked Readiness Index 2010-2011

73 Global Mobile Tax Review, GSMA, 2011

A report commissioned by the GSMA on the impact of taxation on mobile broadband[74] assessed the taxation strategies employed by countries across the world in relation to the mobile industry (see Figure 32). The report identified that taxation strategies ranged from minimising levies to encourage adoption of mobile services, to sector specific taxes to maximise government revenue. Surprisingly, some of the more developed countries in Africa such as Nigeria, Tunisia, Ghana, and to a lesser degree Kenya, were shown to adopt revenue maximisation approaches rather than driving uptake. Countries with tax maximisation policies should examine their approach to make sure that they are not hampering overarching development goals. A consequence of these taxation policies is that countries may require higher public funding to drive universal service and their ICT development goals.

Figure 32: Approach to taxation of selected African countries[75]



Other studies by GSMA[76] found that in many cases, a reduction in mobile-specific taxes can actually increase total tax revenue while generating significant economic and social benefits for the country. For example, in Ghana and Cameroon it was estimated that removing mobile-specific taxes would increase total tax revenue in the first year.

Telecom-specific taxes raise entry barriers to new competition and drive up prices. They push mobile access beyond the reach of customers who need mobile access the most, those in lower socio-economic groups. Ultimately, taxation can act as a key lever in encouraging the adoption of mobile services by lowering prices and breaking down entry barriers for end-customers.

In June 2009 the Kenyan government, recognising the importance of enhancing access to mobile telephony, decided to exempt mobile handsets from VAT. This has generated significant benefits for many Kenyans. Handset purchases have increased by more than 200% since the removal of VAT and penetration rates have increased substantially, from 50% to 70%. This successful policy confirms that consumption taxes can have a significant impact on consumer behaviour.

74 GSMA - The Impact of Taxation on the Development of the Mobile Broadband Sector

75 GSMA - The Impact of Taxation on the Development of the Mobile Broadband Sector

76 GSMA - Taxation and the growth of mobile services in sub-Saharan Africa

9.3. Incentives to drive universal access, not USFs

Universal Access/Service regimes have a commendable agenda; to spread access to communications to all citizens. This is a vision shared by governments, regulators and the mobile industry across the world. However, some of the means used to achieve these goals are questionable.

Across Africa, regulators have established Universal Service Funds (USFs) in order to subsidise increased access. USFs typically work on a 'pay to play' model whereby levies are collected from operators (mostly as a percentage of adjusted gross revenue). In theory, these funds are redistributed to interested operators to enable otherwise loss-making new mobile services to become commercially viable. At least 22 countries in Africa currently have USF levies in place with Niger, at 4% of gross operator revenues, amongst the highest in the world.

Table 3: Universal Service Fund Levies in selected African countries (2009)[77]

Country	Fund status	Operator levy
Algeria	Operational	3% of net revenues
Burkina Faso	Operational	2% of revenues
Cote d'Ivoire	Operational	2% of revenues from licence fees
Gabon	Operational	2% of net revenues
Ghana	Operational	1% fixed operators revenues
Kenya	Planned	0.5% of revenues
Lesotho	Operational	1% of revenues
Madagascar	Operational	2% of revenues
Malawi	Operational	1% of revenues
Morocco	Operational	2% of revenues
Mozambique	Operational	1% of revenues
Niger	Operational	4% of revenues
Nigeria	Operational	1.25% of revenues
Rwanda	Operational	2% of revenues
Senegal	Operational	3% of revenues
South Africa	Operational	0.2% of revenues
Sudan	Operational	USD 0.42 mobile to mobile minute, 50% unused minutes of pre-paid cards, operator contribution
Swaziland	Operational	0.1% of revenues
Tanzania	Planned	Annual contributions by electronic comms licensee
Togo	Operational	2% of revenues
Uganda	Operational	1% of revenues
Zimbabwe	Operational	2% of revenues

However, the impact of these funds is limited for several reasons. Firstly, according to a 2007 study commissioned by the GSMA which reviewed USFs in 15 developing countries, most of the monies (74%) that have been collected had not been distributed[78]. This implies that either levies are higher than required or that an effective funds distribution strategy might not exist.

Secondly, there are issues around disbursement. The study highlighted that funds were being unfairly distributed to fixed-line operators rather than mobile operators. Mobile operators although contributing approximately one third of USF monies, have received less than 5% of the distributed funds.

77 Intelecon - Universal Access and Service Funds

78 GSMA - Universal Access: How Mobile can Bring Communications to All

Finally, universal funds can be eaten up by overheads. The Technology Policy institute analysed the performance of the universal service program in the USA from 1998-2008 and found that of each dollar distributed to recipient firms, 59% went on general and administrative expenses.

This therefore begs the question of how governments and regulators should reform their USFs and what should be done with funds already collected but not yet distributed. Governments and regulators are urged to consider the following:

- USFs should have clear goals, targets, timelines and processes for both the collection and distribution of funds to ensure transparency and measurement
- USFs should be reviewed on a regular basis and should be removed upon the achievement of the original goals
- Funds collected should be distributed in an open and consultative process involving industry stakeholders
- USF allocation policy should be on a least-cost technology basis that drives the highest population connectivity at the lowest cost
- USFs should be spent on infrastructure that could be shared amongst multiple players (such as towers and backhaul) to achieve greater efficiency of funds

Therefore, whilst Universal Access/Service is a worthy aim, USFs, especially when poorly managed, may not be the best way to do this. Governments and regulators can positively influence penetration by reducing telecom-specific taxes which hamper mobile take-up, especially among those at the bottom-of-the-pyramid. Another lever available to governments is introducing innovative licensing frameworks to attach coverage requirements for underserved areas to new coveted spectrum/licenses issues (as carried out successfully in the Philippines).

9.4. Importance of liberalised markets

With mobile telecommunications providing an important engine for growth, continuing to stimulate growth and to ensure mobiles remain affordable for all will require further liberalisation and reform of certain segments of the telecommunication market.

For example, the impact of the liberalisation of international gateways on the development of the nascent African roaming market should be considered. Although there has been much improvement in the level of competition, international gateway monopolies still exist in at least 50% of sub-Saharan[79] African countries. The international call component is a key element in roaming calls given that over two-thirds of roaming calls are made to family and friends back home. International long distance termination costs are a large component of wholesale costs which are out of the control of operators in routes with monopolised international gateways. Even with volume growth, there is no bargaining power for operators whilst gateways are not liberalised. Liberalisation of international gateways can reduce end-user prices particularly for roaming and international calls. In the Middle East, international call prices declined by up to 90% in the years following liberalisation, and roaming call prices between Arab countries with liberalised gateways were substantially lower than between Arab countries with gateway monopolies. Similar trends would be expected following the liberalisation of international gateways in Africa.

Equally, issues remain in relation to the installation of submarine cables and the access to landing stations. As highlighted earlier, the growth in submarine cable connections with Africa can have a substantial impact on access prices, particularly when private operators have installed the cable. But with cables installed by consortium this is not always the case. These consortiums are not usually run as a primary business. Instead, large players and incumbents join consortium as a means of vertical integration. Consortium members typically get capacity at cost, whilst smaller shareholders have to pay a premium to larger shareholders. Non-members then pay a premium over members that is given back to shareholders as a dividend. Additionally, as access to the landing station is typically controlled by the incumbent of that country, premium prices are even charged to members of the consortiums. As a result, consortium cables can initially have little impact on prices when they land in a country as the members have little incentive to reduce prices in the absence of competition.

Whilst different business models may emerge for the provision of capital needed for these large scale investments, governments should encourage competition in both mobile access networks and back-haul services. This will allow the mobile industry to continue to lower costs and to drive uptake of communication services across the continent.

79 ITU 2005, GSMA/Case Associates 2007, A.T. Kearney analysis

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The first African Mobile Observatory was a joint research study between the GSMA, A.T. Kearney and Wireless Intelligence.

Any questions on the content of this document can be directed to the authors of the study.

The GSMA represents the interests of mobile operators worldwide. Spanning more than 220 countries, the GSMA unites nearly 800 of the world's mobile operators, as well as more than 200 companies in the broader mobile ecosystem, including handset makers, software companies, equipment providers, Internet companies, and media and entertainment organisations. The GSMA also produces industry-leading events such as the Mobile World Congress and Mobile Asia Expo.

For more information, please visit Mobile World Live, the online portal for the mobile communications industry, at **www.mobileworldlive.com** or the GSMA corporate website at **www.gsmworld.com.**

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