



Models and strategies for ICT Infrastructure investment in selected African countries: a regulatory perspective

Enrico Calandro & Mpho Moyo



researchICTafrica.net



Purpose of paper

- Explore investment models and strategies adopted to develop national broadband backbone networks in selected African countries
- Identify policy and regulatory bottlenecks that need to be overcome in order to achieve an optimal investment environment, conducive to improved backbone coverage in selected African countries
- Exploring policy and regulatory frameworks and market structures that influence investment decisions on backbone infrastructure rollout
- Provide recommendations on how to stimulate infrastructure investment in broadband backbone by creating an enabling policy and regulatory environment
- Five case studies: Cote D'Ivoire, Ethiopia, Kenya, South Africa and Uganda





Research questions

- Central question: what policy and regulatory interventions are necessary to create an enabling environment to encourage the private sector to invest in broadband backbone networks?
- Specific queries:
 - Is there a strong case that proved to be successful, in the selected countries, for the rollout of backbone networks without government intervention?
 - What policy and regulatory bottlenecks need to be removed in order to attract private investors to rollout national broadband backbones or to use government stimulus packages in the the case of market failure?





Methodology

- Questionnaires: guideline for researchers collecting and analysing data and information on national broadband backbone rollout strategies.
- Based on empirical evidence, recommendations were provided on how to encourage backbone rollout in the selected countries.
- The following stakeholders were interviewed by the researchers
 - Regulators/Policy makers
 - Government Officials
 - Operators
 - Commentators





Research limitations

- The research focuses on the rollout of the national fixed broadband infrastructure
- Wireless or Mobile Broadband is not covered in this paper





State-led strategies to build fixed
line networks have been
unsuccessful



Ownership of incumbent fixed-line operator

Country	Name	Date of privatisation	% Government Ownership*	Market share
South Africa	Telkom South Africa	1997	39,80%	//
Kenya	Telkom Kenya	2007	49%	100%
Uganda	Uganda Telecom	2007	31%	86%
Ethiopia	ETC	N/A	100%	100%
Côte d'Ivoire	Côte d'Ivoire Telecom	1997	49%	93%

Source: RIA 2011





Number of fixed lines as a % of the population

	2007	2008	2009
South Africa	9,22	8,91	8,62
Kenya	1,23	1,67	1,67
Cote d'Ivoire	1,23	1,73	1,34
Ethiopia	1,12	1,11	1,1
Uganda	0,54	0,53	0,71

Source: ITU, 2010





Findings

- Fixed-line market segment dominated by state-owned incumbents
- Vertically-integrated market structure: legacy of monopoly fixed line operators and control of the government over essential facilities
- State-led model failed to achieve the stated objectives of access to basic communication services since fixed line connectivity has not grown beyond 3 per cent with the exception of South Africa.





Similarly state-led investment strategies have been adopted to rollout broadband backbone infrastructure





South Africa

Backbone extension strategies	Ownership and Management	Investment (USD)
11,000KM network through PPP, but private partners withdrew following disagreements. Network has expanded to 12250km	Infraco Broadband Limited (wholly owned by the state)	Approximately 2007-2010
5000km network	MTN, Neotel and Vodacom (co-building)	Approximately 300 million
2200km dark fibre laid	Dark fibre Africa	Approximately 300 million





Kenya

Backbone extension strategies	Ownership and Management	Investment (USD)
The private sector was contracted to build 5000km fibre optic network	The cable is operated by Telkom Kenya on behalf the government.	60 million
It has a 4000 km fibre optic network	Kenya Data Networks	In 2009 Altech increased its interest to 60.8 % and provided 39.5 million capital injection to expand the fibre optic network





Uganda

Backbone extension strategies	Ownership and Management	Investment in (USD)
Huawei contracted to rollout 2100 km of fibre in three phases	The network is operated by the incumbent Uganda Telecom	106.59 million





Ethiopia

Backbone extension strategies	Ownership and Management	Investment (USD)
10 000km network jointly built by government and Chinese vendor ZTE	Owned by Ethiopian government	Approximately 2.0 billion USD





Cote d'Ivoire

Backbone extension strategies	Ownership and Management	Investment (USD)
2000 km fibre optic network	The cable is operated and managed by the incumbent operator Cote d'Ivoire Telecom	90 million





Regulatory bottlenecks continue to stifle private sector investment





Regulatory bottlenecks

	South Africa	Kenya	Uganda	Ethiopia	Cote d'Ivoire
Market Entry	managed liberalisation	3G licence too high	Spectrum shortage	Monopoly	Monopoly fixed-line incumbent, high costs for 900 and 1800MHz
LLU	expected to be completed by 2011	non-discriminatory access to the last mile	Non addressed	Monopoly	None
Infrastructure sharing	Supported by the regulator but no regulation	Only guidelines	Announced but not implemented	None	Not in place





Regulatory bottlenecks

	South Africa	Kenya	Uganda	Ethiopia	Cote d'Ivoire
Converged Licensing Regime	Yes	None	Yes, 2005	No	Yes
UAS	Yes	No	Yes, 2001	No	No
Spectrum	2.6GHz not auctioned	Auctions not used yet	New entrants cannot access spectrum	Spectrum used by the incumbent monopoly	Lack of enforcement in spectrum management





Broadband roll-out strategies tend to focus on the supply side and to less extend the demand side





Broadband penetration

Country	Internet Subscriptions in 2009 per 100 inhabitants	Internet users in 2009 per 100 inhabitants	Fixed broadband Internet subscriptions in 2009		Mobile cellular subscriptions with broadband access 2009	
			per 100 population	Total	per 100 population	Total
South Africa	Not available	8, 82	0,96	481 000	10,52	5 271 825
Cote d'Ivoire	Not available	4, 59	0,05	10 000		
Kenya	2,11	10, 04	0,02	8 349	4,98	1 981 048
Uganda	0,91	9, 78	0,02	6 000	1,10	360 000
Ethiopia	0,58	0, 54	0,00	3 498	0,10	84 773

Source: ITU





Conclusions

- ❑ Investment model for backbone rollout is a state-led financing model rather than public-private-partnerships
- ❑ *The model of public led investment and management of backbones by state-owned incumbents or state managed entities may result in a replication of the model of telecommunications with vertically integrated state-owned incumbent operators.*
- ❑ *It may lead to the same failures experienced by state-owned fixed-line operators in the expansion of fixed line communications, unless the companies are structurally separated from other entities in the sector - such as government or other public entities*





Recommendations to facilitate investment in broadband networks

- Remove regulatory restrictions to facilitating an open access and non-discriminatory regime
- Strengthen competition law and introduce competition in the downstream market segment
- Expand the definition of universal access and service to take into account converged technologies and high-speed broadband networks





Recommendations to facilitate investment in broadband networks

- Remove regulatory restrictions to facilitating an open access and non-discriminatory regime
- Strengthen competition law and introduce competition in the downstream market segment
- Expand the definition of universal access and service to take into account converged technologies and high-speed broadband networks





Recommendations (Contd...)

- In the short-term, use existing universal access funds to provide attractive incentives to the private sector to invest in broadband networks, especially in rural perceived uneconomic areas.
 - The universal access fund can be used as a subsidy for the private sector to rollout backbone networks
 - The fund in the future must be funded through the general tax system in order to remove market distortions
- Other forms of incentives include tax breaks
- Stimulate the demand for broadband and utilisation IP-based services through demand-side stimulus packages
 - Government can act as an anchor client in rural and perceived uneconomic areas.
 - Government can invest in shared infrastructure and encourage infrastructure sharing

