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# A4AI-Mozambique
# Multi-stakeholder Coalition
# *Workshop: Infrastructure Sharing and Open Access*

Sonia Jorge, Executive Director

Alliance for Affordable Internet

www.a4ai.org

# Agenda

- Telecom infrastructure in Mozambique:
  – Status report
- What is the state of infrastructure sharing in Mozambique?
- Obstacles and opportunities

# TELECOM INFRASTRUCTURE IN MOZAMBIQUE

Espinha Dorsal da Rede Nacional
de Transmissão (Backbone)

# Movitel Fiber Network, 2013

Source: RIA's Report, 2013

# Mozambique Coverage



## Legend

- ▨ GSM Coverage
- ▢ Provincial Boundary
- ▢ District Boundary
- ▢ Admin Posto Boundary
- · 2007 Population Centres
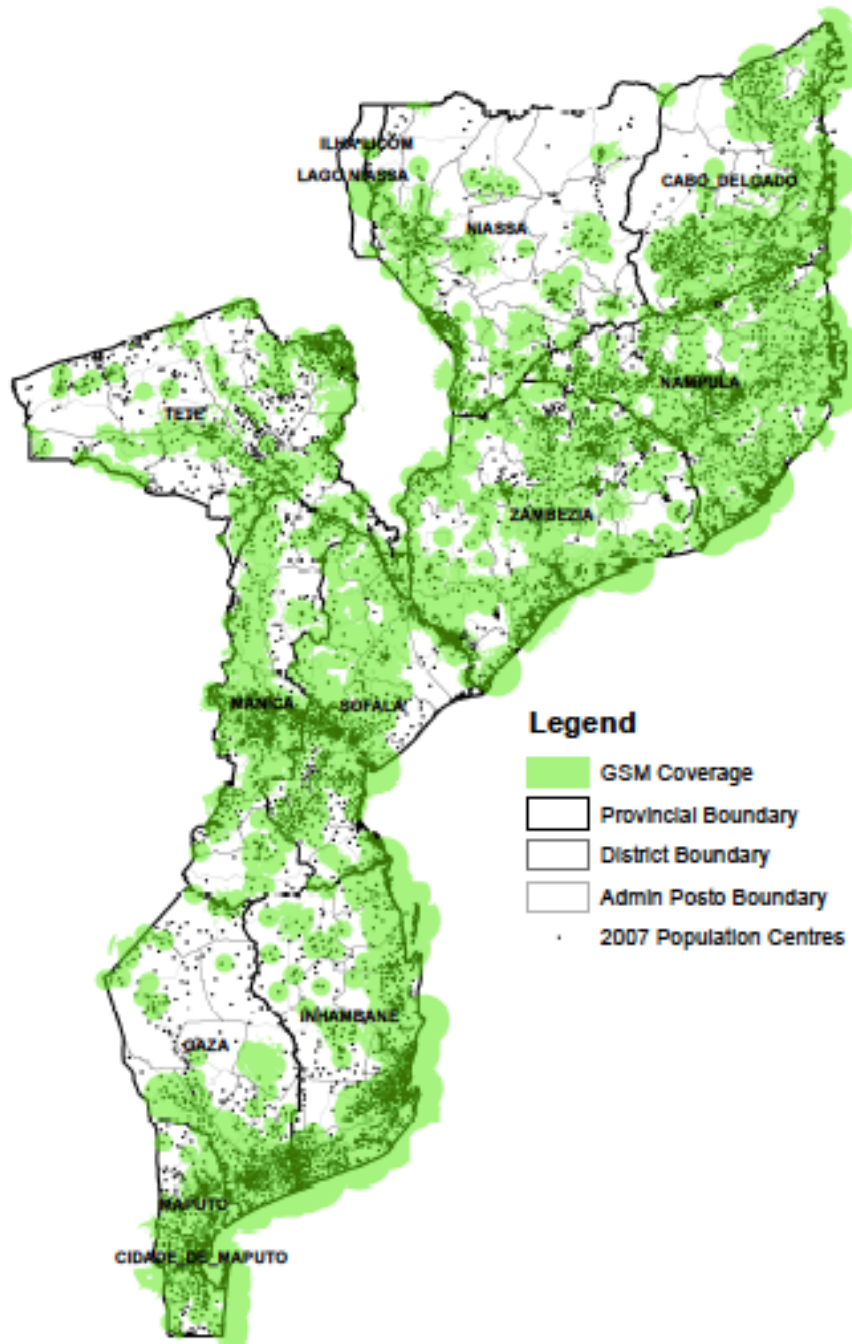
# Mobile Operators Infrastructure

- mCell:
  - BTS network?
  - % national coverage?
  - Fiber infrastructure?
  - Generally must use TDM's network

# Mobile Operators Infrastructure

- Vodacom:
  - BTS network?
  - Has invested in about 100-150 new towers since Movitel entered the market
  - % national coverage?
  - Has invested in its own microwave backbone, has rolled out fiber in the Maputo area and had plans for further fiber investments outside Maputo

# Mobile Operators Infrastructure: Movitel

- 2,800 2G/3G base stations and 25,000 km of fiber optical cables covering 100% of districts, serving nearly 80% of the Mozambican population.
- In rural areas, increased its coverage area from 60% to 85% and doubled the number of covered people from 35% to 75%.
- Diversified distribution channel network with 153 shops, 12,600 agents and points of sales and nearly 4,000 direct sales staffs to deliver door-to-door services in every village.

- Nearly 600,000 people in at least 5 rural districts have been covered and served telecom services for the first time in life.
- Tariff plans have been tailored to be affordable and flexible for different groups.

# Mobile Operators Infrastructure

- Movitel claims to account for 70% of the country's fiber optical cable infrastructure and 50% of the mobile phone network infrastructure (e.g., towers)

- Movitel has introduced an "Internet connection to schools" program to supply free broadband Internet to 4,200 schools nationwide.

- 2,500 schools were connected at the end of 2013

Source: APO, **The impact of Movitel on ICT in Mozambique,** *Nguyen Thai Khang*

# THE STATE OF INFRASTRUCTURE SHARING IN MOZAMBIQUE

A4AI Affordability Index

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Not one of the 51 developing or emerging countries surveyed for the Affordability Report can claim to meet the UN target of broadband priced at less than 5% of monthly income for those 2 billion people living in poverty (on less than $2 a day).

# The foundations of affordability

# Affordability Index

# Affordability Index



**Mozambique**
Africa

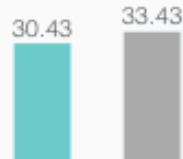| | | |
|---|---|---|
| Population | 25,833,752 | 500MB Mobile Broadband (% GNI)     40.54% |
| GNI per capita | USD 1,100.00 | % of people living in poverty     82.49% |

Select an indicator

To what extent does the government facil ⌄    Go
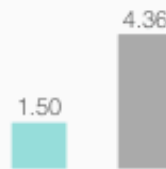
**Score**

1.50
OUT OF 10

Mozambique ●
Mean developing ●

4.36

1.50

**Ranking**

46   out of 51 countries     28   out of 30 developing countries

**Affordability Index**

value    30.43
ranking    42

**Communications Infrastructure sub-index**

value    24.53
ranking    41

**Access sub-index**

value    36.63
ranking    38

# Current Policy and Regulations

Decreto n.° 62/2010:

Aprova o Regulamento de Partilha de Infra-estruturas Passivas de Telecomunicações e outros Recursos de Rede.

- Mozambique established Passive Infrastructure Sharing Regulations before the third operator entered the market; however no incentives were provided

- There is no enforcement of current regulation, which does require for deployments to be planned for sharing purposes and even imposes sanctions if it does not take place

- Recently approved new telecom law establishes a forward looking framework to promote sharing and establish market incentives to do so

# OBSTACLES AND OPPORTUNITIES FOR SHARING

# Obstacles and opportunities

## Obstacles

- Infrastructure standards differ among operators
- Infrastructure deployment is not planned with sharing in mind
- Low trust among operators

## Opportunities

- Revise current regulation to include concrete incentives
- Establish minimum standards for infrastructure investment to ensure sharing opportunity
- Mandate sharing for all subsidized infrastructure

# Thank you!

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# Break out Groups

- Break out into 4-5 groups.
- Each group chooses one moderator - this person will stay at the same table throughout the exercise and take notes.
- Group comes up with 1-2 recommendations (for example 2 policy recommendations on Infrastructure Sharing)
- After 10-15 minutes, everyone (except for the moderator) moves to a new table (groups don't have to stay together).
- Once everyone has rotated, the moderator will explain to the table the recommendations of the previous group. The job of the new groups is to edit and refine the prior group's recommendations.
- Rotate the room at least once more.
- At the end, the moderators will report back on the final recommendations, which by now will have gone through at least two rounds of refinement. A notetaker records the final recommendations in a document.

# REPORT BACK & ACTION PLAN

# Reports from Groups

- As per Group's discussion:

# Next Steps:

- Integrate knowledge and information gained into work plan

- Identify priority taxes/duties to tackle

- Finalize work plan, including set of activities/tasks necessary to achieve outputs

# SUPPORTING CASES

# Burundi: Huge price reductions

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## The impact of shared infrastructure on network prices and quality in Burundi

The Burundi Backbone System (BBS) is a partnership between different players with the intention to share a national backbone on an open access principle. It is a joint venture between the Government of Burundi, with initial financial support from the World Bank and four telecom operators (Ucom Burundi, Africell Tempo, Onatel and CBINET). The model separates the roles of the service provider and the network operator and provides services to operators on a fair and non-discriminatory basis.

The BBS is an independent infrastructure provider (Infraco) company that manages the Burundi backbone and ensures connection of the network to the landing stations of submarine fibre optic cables via Tanzania, through Rwanda, and onward to Kenya through Uganda. It operates and maintains the fibre optic communication network, and leases fibre optic connections to operators and companies, as well as to the government.

Based on interviews with BBS representatives, we learned that the completion of the backbone network and availability of relatively competitive access to international submarine cables has already reduced broadband prices from an average of US$1200 per Mbps/month to about US$300 per Mbps/month for end-users in Burundi. The government of Burundi is also one of the main beneficiaries of the initiative. It has negotiated a 10 year Indefeasible Right of Use (IRU) to deliver Internet connectivity for ministries and other government offices in the capital city of Bujumbura.

# Scope and Ease of Infrastructure Sharing

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## Scope of Infrastructure sharing

**LAND AND BUILDINGS**

- Civil works
- Rights of way
- Kerbs and in-building

**OTHER SECTORS INFRASTRUCTURE**

- Sewage /water systems
- Railroads
- Power grids
- Roads
- Gas and oil pipelines

**TELECOM INFRASTRUCURE**

- Ducts
- Poles
- Sites
- Masts
- Dark fibre
- Wavelength
- Active network elements

## Ease of Infrastructure sharing

New construction :
- **Roads, powerlines & gas, water and oil pipelines**
- **Building and housing estates**

- **Civil engineering works of other operators**
- **Existing sites and masts**
- **Existing rail links & powerlines fibre**

- Existing telecom fibre networks
- Local loop of existing operators

**Easier sharing**

**Harder sharing**

Source: APC/Deloitte Study 2015

# Major Benefits of Infrastructure Sharing

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| Reduced Opex and Capex & Release of capital assets | Lower barriers to entry increase competition | Lower asset duplication: |
|---|---|---|

| Expansion of network and coverage | Lower service prices | Reduced visual and environmental impact |
|---|---|---|

**Increase in take up and connectivity** → **Economic & Social Benefits**

Source: APC/Deloitte Study 2015
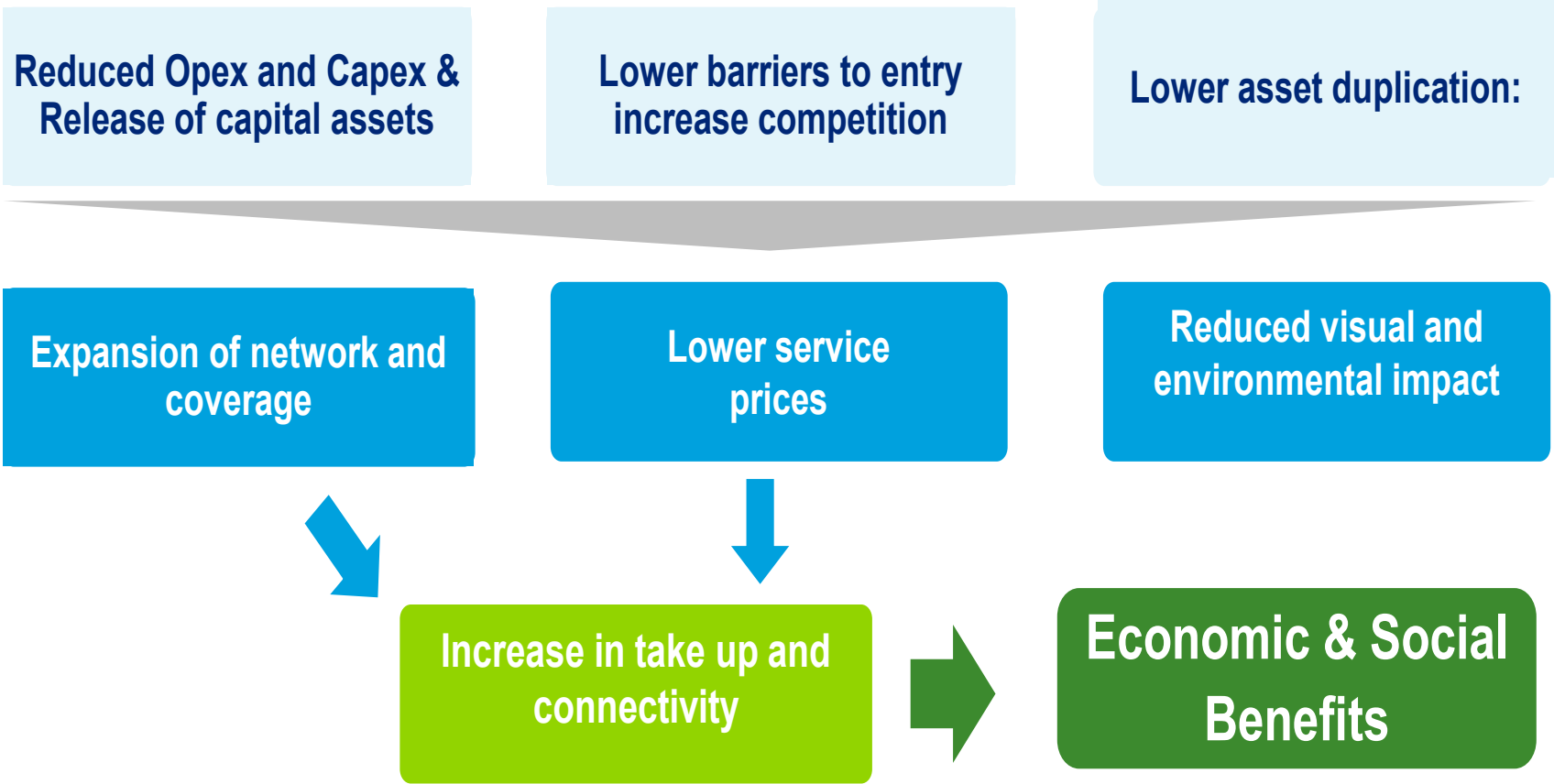
# Broadband InfraCo – South Africa

Broadband InfraCo, a South African state-owned enterprise, was founded in 2007 to help drive down the costs of terrestrial fibre in the country by operating the national fibre network assets of the electricity provider Eskom and Transtel, the telecom arm of the national railway company. Since its creation, Broadband Infraco expanded the network based on the original fibre cables on Eskom's power transmission lines and Transtel's railway infrastructure.

In order to facilitate the entry of a second national operator, initially Broadband Infraco leased its network only to Neotel. In 2010, Broadband Infraco launched its commercial services to the broader telecommunications market.

The launch of the network was delayed due to a lack of coordination between its shareholder, the Department of Public Enterprises, and the Department of Communications, which was responsible for the licensing, and it could not keep the interest of the network operators who proceeded to invest in their own networks, undermining the InfraCo business model.

# India's public sector undertakings and the National Optical Fibre Network (NOFN)

In addition to the fibre networks of national operator BSNL and of several private operators, many of India's state-owned utility providers (e.g. Railtel and Power Grid) also have nation-wide fibre networks, which they lease to telecom operators. Most of these networks are concentrated in densely populated areas, so that broadband access in rural areas remains limited.

In 2011, the government of India approved plans for a National Optical Fibre Network (NOFN), which is going to connect all of India's 250,000 Gram panchayats (village-level administrations). This will be achieved by sharing existing fibre infrastructure of public telecom and utility operators such as BSNL, Railtel and Power Grid and by deploying additional fibre, where necessary.

In order to identify connectivity gaps, the National Informatics Centre carried out a geographic information system (GIS) mapping of the existing optical fibre networks. This information was used to calculate incremental deployment of new fibre.

The project, which is estimated to cost USD$4 billion, is funded by the Universal Service Obligation Fund (USOF). Upon completion, the NOFN will be available to telecom operators and internet service providers on an open access model. The NOFN was supposed to be completed within two years; however, due to numerous delays due to factors such as tendering processes, the deadline has been extended to June 2016.

# Africa's rising tower business and the case of Eaton Towers in Kenya, Uganda and Ghana

Estimates indicate that, while in 2013 17% of Africa's 150,000 towers were owned or operated by towercos, this number is expected to increase to 38.8% by the end of 2014.

Eaton Towers, a pan-African tower company, entered sale and lease back agreements with Orange and Warid in Uganda; outsourcing of operations agreements with Orange and Telkom in Kenya; and with Vodafone in Ghana. Besides the maintenance of existing sites the deals also involve the construction of new towers, expanding operator's coverage while reducing cost. With about 2,400 towers, Eaton Tower's is currently the fourth largest tower company in Africa.
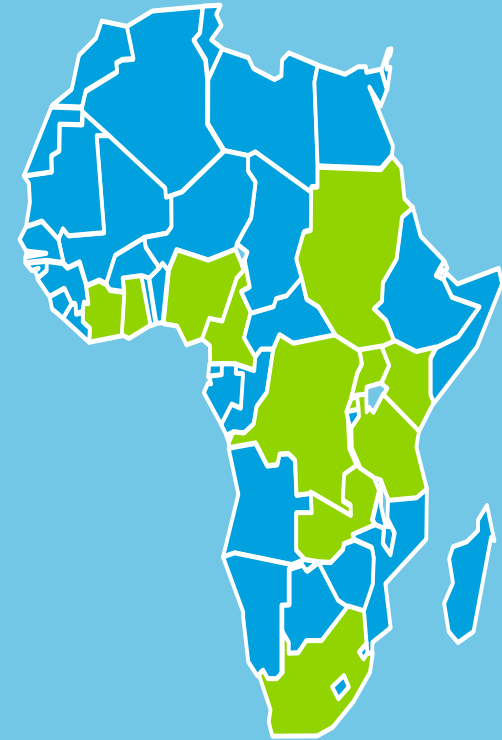
Countries with operations by tower companies

# National Optical Backbone in Cote d'Ivoire

While Cote d'Ivoire has a high mobile penetration rate (91%), the country had only about 1m internet users by 2013. Currently, 85% of internet users reside in the capital Abidjan.

In order to bring broadband access to the country's more rural areas, the government begun construction of a state-owned National Fibre Optical Backbone in 2012. The project is financed with the help of the National Telecommunications Fund, which is funded by taxes paid by operators.

Upon completion, the network is expected to measure 6,700km and connect up to 30% of the country's population to the internet. Phase I was completed in 2012 and Phase II started in 2013. The final three stages are scheduled to begin in 2014.

# Burundi's national fibre backbone - The Burundi Backbone System (BBS)

Before Burundi gained access to an international fibre cable in 2012, internet access was dependent on expensive satellite connections and was limited to a small number of urban subscribers. In rural areas the backbone network remained underdeveloped .

To solve this problem the government created a PPP with the Burundi Backbone System (BBS) in 2010. BBS is a company that was formed as a joint venture between four of the country's leading telecom operators and one ISP.
The World Bank provided the Burundian government with a loan of US$11.5m to help finance the US$25m project.

The project involves the creation of a 1,250km fibre optic backbone connecting all 17 provinces. Network connection points at the borders with Rwanda and Tanzania will provide the landlocked country with access to the landing points of international submarine cables in Mombasa and Dar es Salaam.

Although the BBS has been relatively successful, a number of implementation issues have emerged. For example, the government commissioned the Metropolitan Area Network (MAN) in Bujumbura with the aim of connecting government institutions with fibre. This was reportedly seen as a sign of disengagement with the BBS, as part of which 75km of access network were also being constructed in Bujumbura. In addition, the government awarded an additional licence to Viettel, who are rolling out their own national 3G network without using the national backbone. This potentially jeopardises the return on the investment for the operators.