A digitally inclusive Mozambique

For a future proofed society and economy

Audience: Alliance 4 Affordable Internet | Mozambique Coalition | Maputo (Mozambique)

Date: 11 Dec 2018
Our Vision and Mission

Bring digital to every person, home and organization for a fully connected, intelligent world
Contents

- Vision for digital inclusion in underserved areas
- Challenges to overcome with digital inclusion
- Mozambique’s ICT development in relation to Southern African countries
- Solutions to overcome universal coverage gaps
- Recommendations and next steps
ICT Vision: A continent on equal footing with the rest of the world as an information society, an integrated e-economy where every government, business and citizen has access to reliable and affordable ICT services by:

- increasing broadband penetration by 10% by 2018
- broadband connectivity by 20 points
- providing ICT access to children in schools
- providing venture capital to young ICT entrepreneurs and innovators and
- ensuring migration to digital TV broadcasting by 2016.
Internet access is, increasingly, seen as a basic human right for all people.

**Universal Declaration of Human Rights**

1. Everyone has the right to freedom of opinion and expression; that this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers &
2. Everyone, everywhere should have the opportunity to participate and no one should be excluded from the benefits the Information Society offers.

**National Digital Inclusion Association**

Digital Inclusion refers to the activities ensuring that all individuals and communities, including the most disadvantaged, have access to and use of ICTs. This includes 5 elements: 1) affordable, robust broadband internet service; 2) internet-enabled devices that meet the needs of the user; 3) access to digital literacy training; 4) quality technical support; and 5) applications and online content designed to enable and encourage self-sufficiency, participation and collaboration.

**International Telecommunication Union**

“The need to achieve the goal of digital inclusion, enabling universal, sustainable, ubiquitous and affordable access to ICTs for all, including indigenous peoples, and to facilitate accessibility of ICTs for all, in the framework of access to information and knowledge”. This effort is made in order to contribute to the Sustainable Development Goals (SDGs).

Yet, billions remain unconnected globally, hundreds of millions in Southern Africa.

![Source: Internet World Statistics (Dec 2017 Data)](image-url)
Digital Inclusion improves people’s livelihoods through the application of relevant ICT solutions to specific challenges faced

**Education**
- Cover more than rural students
- Improving accessibility to & quality of education

**Health**
- Facilitating remote consultations, diagnosis & treatments
- Assistance/training of qualified physicians from major cities to rural areas

**Agriculture**
- Relationship building with trusted suppliers of seeds, fertilizer etc.
- Use of imagery to improve water management

**Transport**
- Enhances community cohesion by promoting positive interactions between cities and rural areas

**Commerce**
- Africa citizens use mobile money to buy airtime, send or receive money and paying bills

**Employment Creation**
- Focus on quality jobs & productive employment
- An increasing contribution to GDP

**Government Services**
- Participation in government processes
- Birth registration, voter registration etc.
- Communication & information sharing

**Finance**
- Facilitation of trade in goods and services including banking
- Accessibility to economic and social activities like agriculture

**Social & Entertainment**
- Social interactions - keeping in touch with friends & family
- Reduced inequalities of opportunity between rural & urban areas

Benefits of Digital Inclusion is enormous in terms of inherent potential to influence socio-economic development of a country.
Contents

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Several challenges faced in boosting Digital Inclusion in rural areas

**Political and Legal Factors**
- Regulatory regimes
- Excessive government intervention in the industry.
- Privatization of national telecommunications carriers

**Environmental /Tech Factors**
- New technologies for cost saving on network, towers and power
- Inaccessibility due difficult physical terrain

**Economic factors**
- Economic disparities
- Affordability

**Socio-Cultural Factors**
- Low literacy rates in rural areas
- Densely populated rural areas: 70% of population are rural

Several challenges combine resulting in rural areas of Africa and Southern Africa lagging behind urban areas with regard to provision of and access to telecommunications services.
Majority of Southern African countries have less than 50% of their population accessing the internet

Opportunities

✓ ICT enabled economic diversification & growth
✓ NBN Policies and ICT Strategies
  - Countries establish or modify existing NBN Policies and ICT Strategies. Broadband targets specify total connectivity objectives (urban/rural & institution level (household, farms, schools, hospitals etc.) with connection speed.
  - Targets clear for expansion of national backbone for entire country to be connected.
  - Targets for government eService transformation – critical to driving adoption by other societal & business players.
✓ USF activated & used to expedite rural connectivity: All countries to activate and utilize funds to show tangible improvements in rural connectivity.

Challenges

❖ Costly infrastructure, poor ROI in rural areas (Internet penetration rate below 50% in most countries in region)
❖ High funding requirements & high risk for funders
❖ Affordability issues particularly for rural villagers (device, data, content etc.)
❖ Literacy & Digital Literacy gaps
❖ Policy, regulatory & ICT Strategy implementation weaknesses
❖ Government inability to drive digitalization (scale, other priorities, skills etc.)

Source: Internet World Statistics, 2018
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- Vision for digital inclusion in underserved areas
- Challenges to overcome with digital inclusion
- Mozambique’s ICT development in relation to Southern African countries
- Solutions to overcome universal coverage gaps
- Recommendations and next steps
<table>
<thead>
<tr>
<th>Country</th>
<th>Global Connectivity Index 2018 Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>78</td>
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<tr>
<td>Singapore</td>
<td>75</td>
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<td>71</td>
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<tr>
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<td>25</td>
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<td>Bangladesh</td>
<td>24</td>
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<tr>
<td>Mozambique</td>
<td>24</td>
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<tr>
<td>Jordan</td>
<td>34</td>
</tr>
<tr>
<td>Egypt</td>
<td>34</td>
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<tr>
<td>Lebanon</td>
<td>34</td>
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<td>Malawi</td>
<td>23</td>
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<td>24</td>
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<td>23</td>
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<td>23</td>
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<td>Swaziland</td>
<td>22</td>
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<tr>
<td>Sierra Leone</td>
<td>22</td>
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<tr>
<td>Lesotho</td>
<td>22</td>
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<tr>
<td>Madagascar</td>
<td>21</td>
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<tr>
<td>Liberia</td>
<td>21</td>
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<td>Comoros</td>
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Mozambique GCI 2018 results show gap at infrastructure level and on market demand side in particular

Mozambique ranks 83rd of 94 countries surveyed in GCI 2018 showing need for development of Supply, Demand and Experience economic pillars.

Strengths

- Mozambique has a fairly liberalized market which bodes well for increasing competition than can drive down prices and other barriers to entry for end users.
- Broadband has grown over years, but with government intervention and benchmarking to other SADC countries, end users can still benefit from affordable internet access.

Opportunities

- Mozambique has a 17.3% internet penetration with a population of 30.3m.
- Around 16.2% of households access the internet, Mozambique’s market holds substantial room for growth with investment.
- Subscriptions per 100 inhabitants are 0.1 for FBB and 25.7 for MBB - while a challenge, presents opportunity for growth in sector.
- ICT policies are in place but renewal/refreshing to align to new, regional and global benchmarks/goals to benefit the market and country.
- Focus on smartphone prices to reduce further barriers to entry.

Mozambique must focus on moving away from agriculture and mining based economy employment to a more diversified economy and higher skilled workforce - ICT is crucial to this transformation of both the economy and the people who contribute to that economy.
Majority of Southern African countries have less than 50% of their population accessing internet, 17% in Mozambique

- Generally, countries with higher GDP/Capita have higher internet penetration
- Exception is Kenya – 55% lower GDP/capita that SAR average but internet penetration more than 2x SAR average of 32%
- Cluster of poorest SAR countries ito GDP/capita have internet penetration lower than SAR average.

Mozambique is both low income currently with very low internet penetration – to leverage potential of ICT to grow economy & boost skills levels of citizens, ICT must be prioritized.
Smartphone penetration is sub 50% for 18 countries in SAR, Mozambique ranks 20/26.

Southern Africa generally lags with smartphone penetration through biggest growth in internet penetration is expected to come from African countries in coming years.

1. Mozambique’s smartphone penetration is currently just below 18%.
2. Generally, higher GNI/Capita countries have higher smartphone penetrations (>disposable income)

GoM will be aware transforming from low income to upper middle income GNI/capita & beyond will require:
1. Consistent, higher average real GDP growth rate
2. Economic diversification & expansion

GDP or GNI per capita still to reflect a modernizing economy that is increasingly diversified & possibly reliant on digital solutions - GDP per capita grew at average 5% between 2008 & 2017. Gas discovery expected to boost this growth - results awaited.

**Source: WEF**

**WEF changed definition of low income countries calculated using the World Bank Atlas method in 2016:**
- Low-income economies now defined as those with a GNI/capita of $1,025 or less in 2015.
- Lower middle-income economies are those with a GNI per capita between $1,026 & $4,035.
- Upper middle-income economies are those with a GNI per capita between $4,036 and $12,475,
Smartphone distribution in Southern African countries low, but growing - Mozambique averaged 38%

Comparing Southern African countries, evident that:

- Mozambique has median smartphone connections as a % of total device connections.
- Only 23% of total device connections have SIMs in smartphones, rest of SIMs in feature phones and data only devices.

MBB Connections versus Smartphone Uptake Categories

**Cluster 1:** Countries have more smartphones connected that MBB – device affordability issues possibly has less impact in this segment, data or content costs more dominant or user education gaps holding back customers using MBB SIMs firstly with smartphones secondly.

**Cluster 2:** Countries are close to reaching 1:1 ratio for MBB SIM connections to smartphone use with those MBB SIMs. Affordability issues less prominent than Cluster 3, though focus needed on general smartphone penetration for those using 2G SIM and feature phones.

**Cluster 3:** Users in these countries use MBB SIMs but not smartphones with those MBB SIMs – device affordability issues biggest barrier in these countries.

Mozambique positioned in Cluster 3 where work is required to reduce barriers to entry in smartphone market - device costs possibly significant barrier to entry to HSBB services.
Mozambique MBB & smartphone market has much room for development

Of the 30.7m people in Mozambique, 57% of population remains unconnected with 73% not utilizing mobile internet

- This means around 17.5 million ppl remain unconnected with 65% of population being rural – bulk of 17.5 million likely to be rural dwellers.
- Only half (52%) of connections utilize MBB SIM cards
- Of those 7.4 million MBB Sim connections, 77% are in smartphones
- Launch of 4G will improve mobile high speed BB connections, provided increasingly cheaper smartphones available to market.

Question remains, how will rural population be reached with internet connections and online services?

Focused interventions needed in Mozambique telecoms market to drive adoption of high speed Broadband services. MBB and smartphone penetration increase in country will allow people to benefit from digital opportunities, especially true for rural population.
Contents

☐ Vision for digital inclusion in underserved areas
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☐ Solutions to overcome universal coverage gaps
☐ Recommendations and next steps
Huawei believes everyone has the right to be connected digitally, developed solutions to address needs of emerging markets

Carriers face several challenges in considering rural network construction: High Costs, Low Revenue & Long Payback Period

High Deployment Costs
High logistics costs
Traditional D.G. Site Deployment Cost: $x - Civil works 51% Energy equipment 30%

Source: Sudan Market

High maintenance cost
Site access difficulties, high fuel costs, high transmission costs
Satellite transmission fee > $3,000/Mbps Fuel costs > $12,000/year

Source: Pakistan Market

Long ROI
General ARPU coverage is low
ROI time for ARPU value is $2 ~ 3
Traditional station payback period > 10 years

Source: Bengal Market

Huawei launched RuralStar as part of its continuous focus on development requirements for emerging markets

Rural Coverage Challenge
Generally, rural network construction faces range of challenges:
- Difficulties in obtaining transmission resources
- High civil construction costs
- Lack of stable power supply
- Long deployment period.

Solution
Huawei’s RuralStar 2.0:
- Delivers Low-band LTE Relay allowing single-hop transmission distance up to 40 km
- Move from diesel generators for power supply to alternative power sources - runs off solar power
- Relies on 12-m high poles (not larger/expensive macro sites).

Benefits
- Construction costs ↓ 70%
- ROI in around 3 years
- Relay technology connects sites <= 40 km distance
- Substitute for MW & costly traditional satellite narrowband transmission.

Huawei Technologies enables rural connectivity in underserved geographies in Southern Africa through game-changing solutions to reduce deployment & running costs for carriers serving rural or remote villagers in Ghana, Uganda, Nigeria etc.
RuralStar ensures quick deployment at low cost for carriers

- Rural WBB
- Relay site >50 Habitants

- Rural MBB 15m
- Max 300Mbps DL
- Hop1, ≤ 40 km

- Rural MBB 18
- 4T4R
- 2T4R

- Relay site 1000 Habitants

- Relay Site < 50 Habitants

- Coverage Extension 15 m
- Hop2, ≤ 10 km
- Hop3, ≤ 10 km

- Low Power Consumption
  - < 200W@GU
  - < 250W@GUL

- NLOS Wireless Backhaul
  - Low frequency version
  - High frequency version

- Simple Pole
  - 12/18/24m

- Pure Solar
  - 4~15 pcs PV, 300W/pcs
  - 200-600Ah Battery
Once deployed, rural solution has immediate benefits for previously unconnected people

**Ghana Rural Star Deployment**

**Challenge:** 5 Million people remain sparsely scattered across many villages with little access to internet. Power grid does not extend beyond cities usually. Rural connectivity has been poor given low ROI, even with govt. subsidies.

**Socio Economic Benefits**

Rural villages connected in 1 week and solar powered for sustainability. Villagers can quickly utilize services like Mobile Money and connect with family in other villages or cities. Attracting talent to villages easier as teachers, for example, can stay in touch with family in cities.

**Benefits for both operators who can reduce time taken to payback investment costs for rural sites while citizens benefits from connectivity.**

**Nigeria Rural Star Deployment**

**Challenge:** 50% of Nigerians (~90m) live in rural villages. Poor mobile signal coverage. Some villagers walk lengthy distances to make calls in towns plus power constraints render traditional solutions ineffective, costly & unsustainable.

**Socio Economic Benefits**

Rural villagers no longer have to travel long distances to find signal. Large numbers of unbanked rural villagers, access Mobile Money services driving up financial inclusion through digital access.
Contents

- Vision for digital inclusion in underserved areas
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Enablers of Digital Inclusion

- Political will
- Technological infrastructure
- Funding and enabling of partnerships
- Policies and regulations
- Entrepreneurship and management
- Awareness of citizens human capacity

Mozambique has ticked some boxes already – must determine gaps to achieving universal coverage targets and work backwards to achieve!
Regulations and policies should focus on digital inclusion as important precursor

**Regulations & Policies**

- **Digital environment:**
  - Favourable environment universal and inclusiveness
  - Spectrum allocation
  - Infrastructure Sharing
  - Site acquisition

**Funding & Investment**

- **Diversify source of Funding:**
  - Universal Access Funds
  - PPP
  - NGOs & International Organizations (World Bank, IMF, WEF, AfDB etc.)

**Accessibility**

- **Affordability & Relevance:**
  - TAX reduction
  - Competition control
  - Digital education & training
  - Content (local & relevant).
Utilize USF and international aid important to fund universal access service but other models funding & partnership models needed

- Carrier A’s Revenue*1%
- Carrier B’s Revenue*1%

Aids & Loans

Self owned finance

USF

Provide affordable Mobile Internet for low income groups

In 2015 December, China pledged $60 billion in development assistance to Africa, including $5 billion in grants and interest-free loans and $35 billion in concessional loans and export credits

In 2016, Japan announced $30 billion financial support for Africa.

In 2017 March, World Bank announced record $57 billion in financing for Sub-Saharan African countries over next 3 years

The World Bank
IMF
OECD
Official Development Assistance

Self owned finance

International Aid Loans

Carriers

Self owned finance
Recommendations and Next Steps

*Ensuring that all Mozambicans have access to affordable basic communication services is a primary objective of government for telecommunications sector in coming years*

- Drive increased infrastructure sharing initiatives among operators
- Address power supply and transmission issues so that rural coverage can be expanded
- Determine unconnected areas to be prioritized for 3G coverage
- Incentivize non rural carriers to migrate focus from network capacity improvement to network expansion to reach rural areas.
- Include ICT development component as part of all other infrastructure development projects (power, water, road, rail etc.)

*Mozambique has the potential for strong growth in coming years:*
  - Service neutral licensing allows more competition and better prices for end users.
  - Right policy changes being made in areas of licensing and spectrum etc.
  - ICT services can expedite synergies across economic sectors to bring about multiplier effects in economic growth and social upliftment — it all begins with basic Internet access for all!

Huawei is fully committed to supporting Mozambique's digital ecosystem development.
Thank You.