

# A digitally inclusive Mozambique

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For a future proofed society and economy

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

Date: 11 Dec 2018





## **Our Vision and Mission**

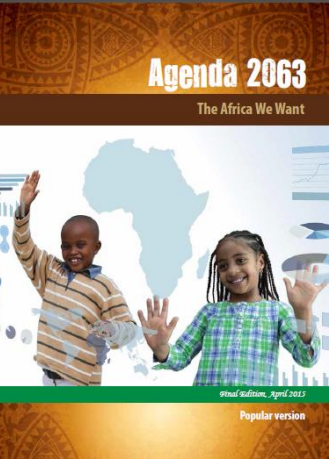
Bring digital to every person, home and organization  
for a fully connected, intelligent world

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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

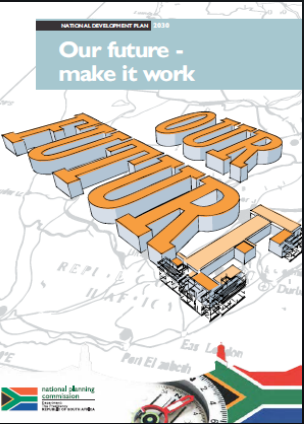


# Understanding Africa's ICT Vision 2063 & Countries' Vision & NDP

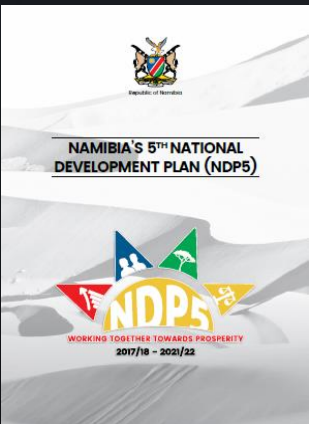


**ICT Vision:** A continent on equal footing with the rest of the world as an information society, an integrated e-economy where every government, business and **citizen has access to reliable and affordable ICT services** by:

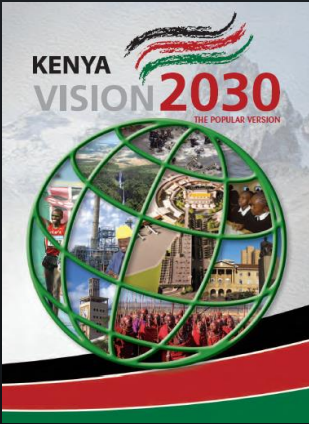
- increasing broadband penetration by 10% by 2018
- broadband connectivity by 20 points
- providing ICT access to children in schools
- providing venture capital to young ICT entrepreneurs and innovators and
- ensuring migration to digital TV broadcasting by 2016.



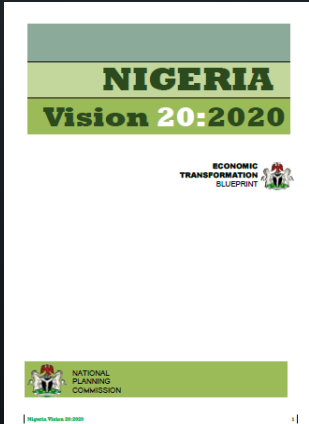
South Africa



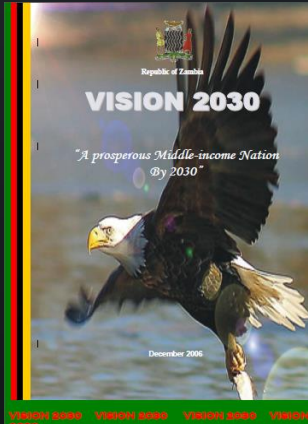
Namibia



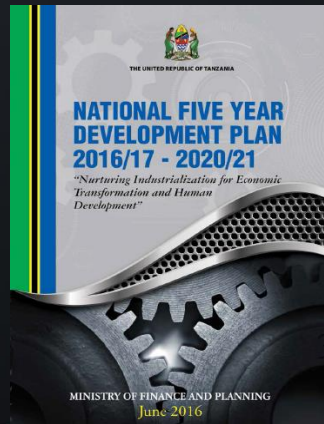
Kenya



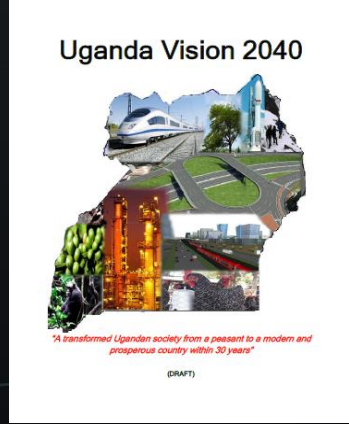
Nigeria



Zambia



Tanzania



Uganda

# 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



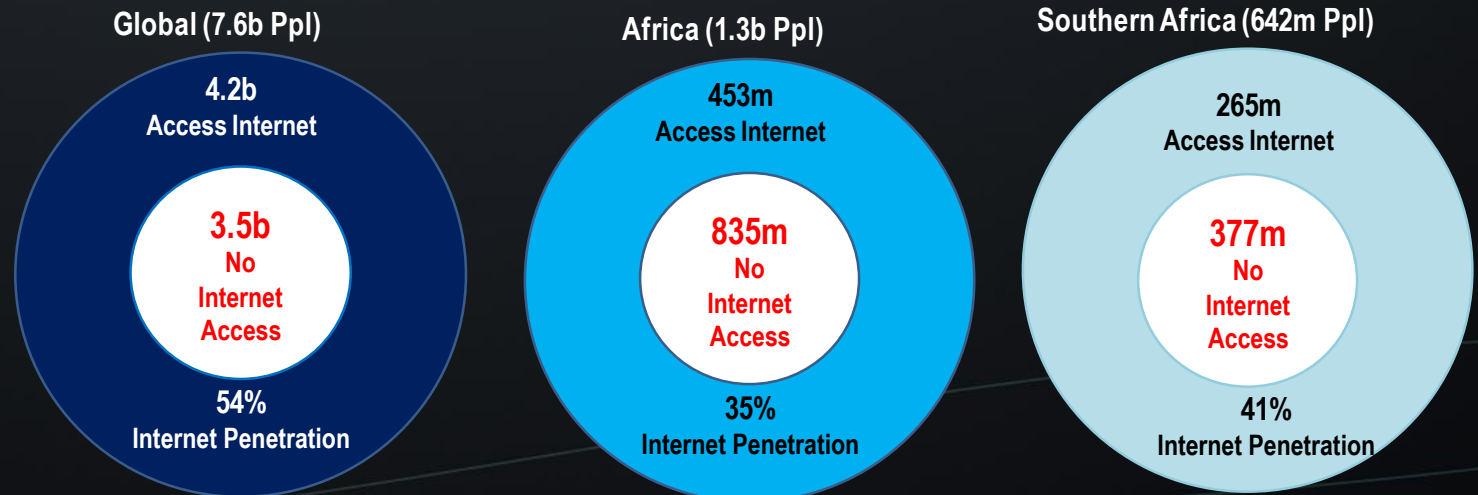
Digital Inclusion refers to the activities ensuring that **all individuals and communities, including the most disadvantaged**, have access to and use of ICTs. This includes 5 elements: 1) affordable, robust broadband internet service; 2) internet-enabled devices that meet the needs of the user; 3) access 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.





# 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.

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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

## Economic factors

- Economic disparities
- Affordability

## Environmental /Tech Factors

- New technologies for cost saving on network, towers and power
- Inaccessibility due difficult physical terrain

## 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.



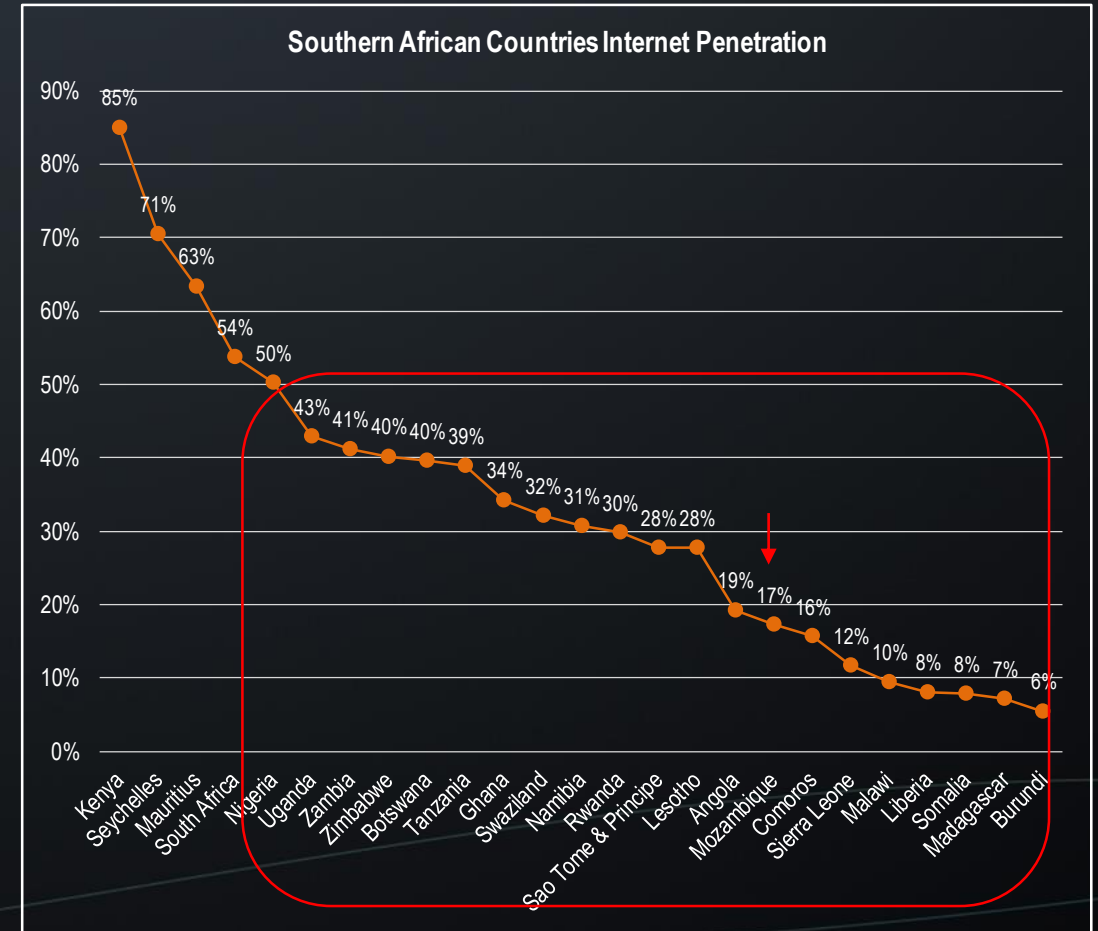
# Majority of Southern African countries have less than 50% of their population accessing the internet

## 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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# Country Global Connectivity Index 2018 Rankings


FRONTRUNNERS		SCORE
1	United States	78
2	Singapore	75
3	Sweden	73
4	Switzerland	71
5	United Kingdom	70
6	Finland	68
7	Denmark	68
8	Netherlands	67
9	Norway	65
10	Japan	65
11	South Korea	64
12	Australia	64
13	Germany	63
14	Luxemborg	63
15	Ireland	62
16	New Zealand	62
17	Canada	62
18	Belgium	61
19	France	61
20	Austria	60

ADOPTERS		SCORE
21	Spain	55
22	Estonia	54
23	UAE	53
24	Lithuania	52
25	Portugal	52
26	Solvenia	51
27	China	51
28	Italy	50
29	Czech Republic	50
30	Hungary	49
31	Slovakia	49
32	Malaysia	48
33	Chile	48
34	Croatia	46
35	Greece	46
36	Russia	46
37	Kuwait	45
38	Poland	45
39	Romania	45
40	Bahrain	45

ADOPTERS		SCORE
41	Saudi Arabia	44
42	Belarus	44
43	Bulgaria	44
44	Brazil	43
45	Kazakhstan	42
46	Mexico	42
47	Oman	42
48	South Africa	42
49	Ukraine	41
50	Uruguay	41
51	Thailand	40
52	Mauritius	40
53	Turkey	39
54	Serbia	39
55	Columbia	39
56	Argentina	38
57	Peru	37
58	Seychelles	36
59	Philippines	35

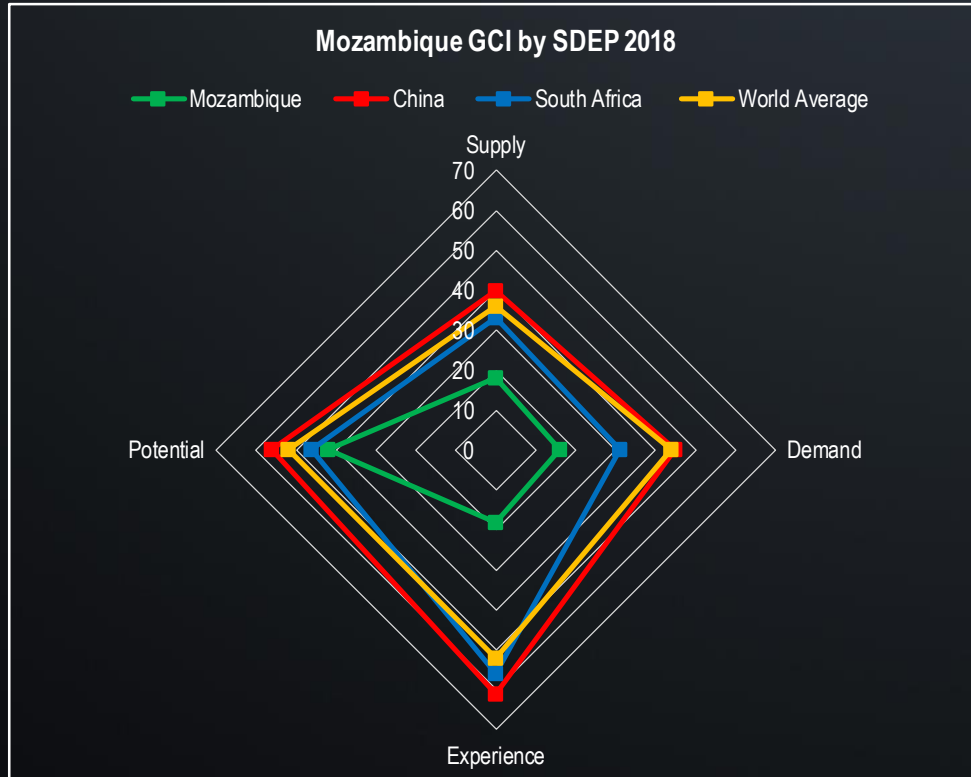
STARTERS		SCORE	STARTERS		SCORE
60	Jordan	34	80	Bolivia	25
61	Egypt	34	81	Pakistan	25
62	Lebanon	34	82	Bangladesh	24
63	Vietnam	34	83	Mozambique	24
64	India	33	84	Zambia	24
65	Venezuela	33	85	Ethiopia	23
66	Indonesia	33	86	Angola	23
67	Morocco	33	87	Malawi	23
68	Algeria	32	88	Swaziland	22
69	Ecuador	31	89	Sierra Leone	22
70	Ghana	29	90	Lesotho	22
71	Kenya	29	91	Madagascar	21
72	Nigeria	29	92	Liberia	21
73	Botswana	29	93	Comoros	20
74	Namibia	29	94	Burundi	20
75	Zimbabwe	28			
76	Rwanda	27			
77	Paraguay	26			
78	Tanzania	25			
79	Uganda	25			

# Mozambique GCI 2018 results show gap at infrastructure Level and on market demand side in particular

	COUNTRY RANK	SCORE
	83 /94	24 /100



Mozambique ranks 83<sup>rd</sup> 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

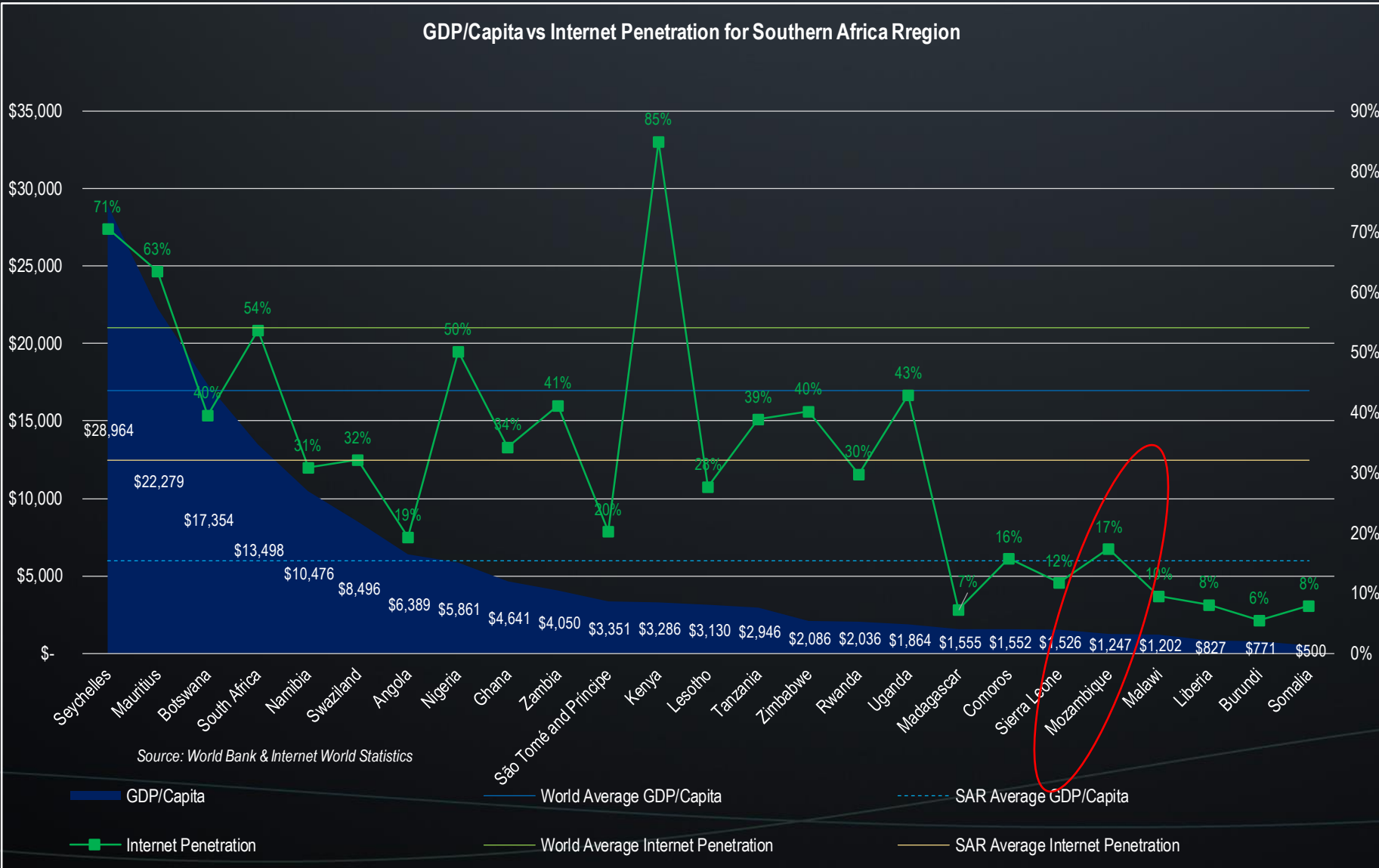
- Mozambique has a **17.3% internet penetration** with a population of 30.3m.
- Around **16.2% of households access the internet**, Mozambique's market holds substantial room for growth with investment.
- Subscriptions per 100 inhabitants are **0.1 for FBB and 25.7 for MBB** - while a challenge, presents 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.

Source: Huawei GCI & ITU Country Profile (2018)

**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 its 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.

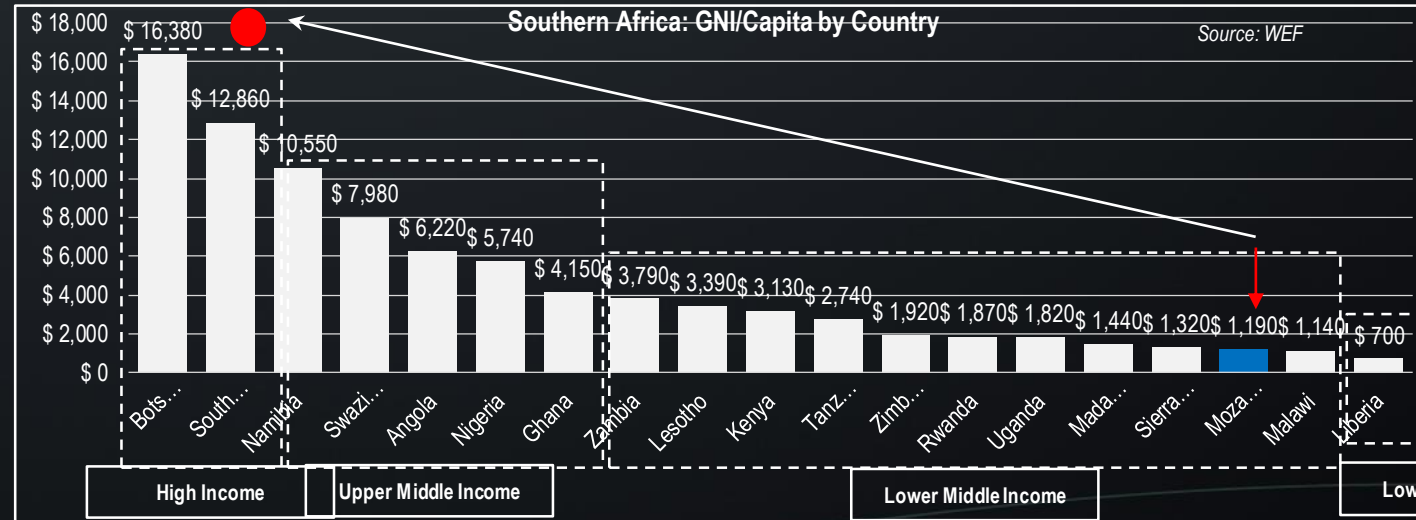
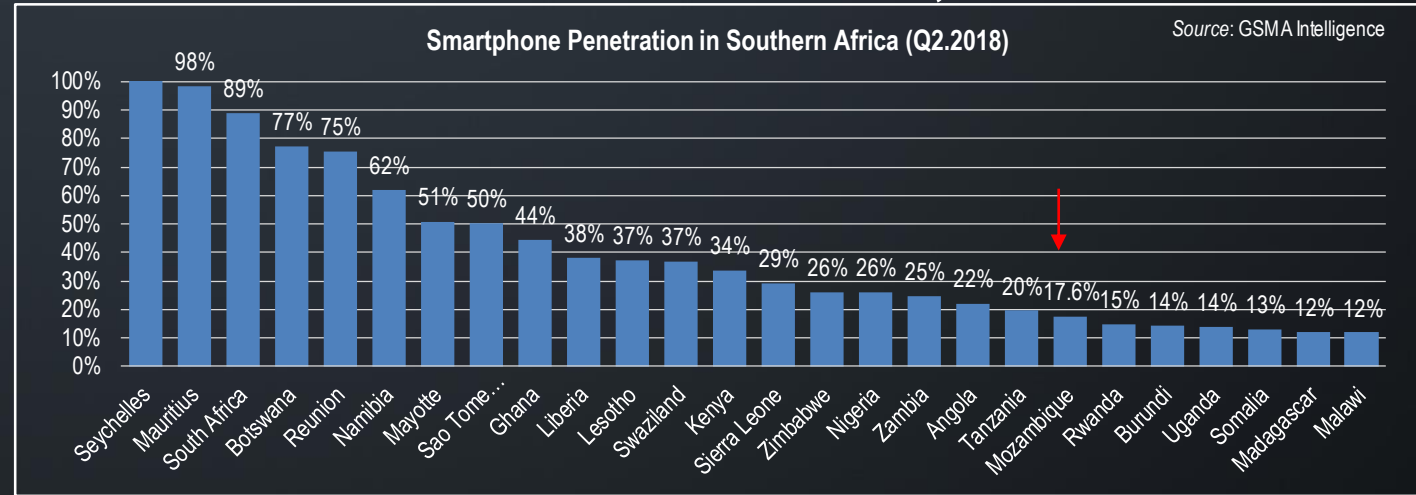
Southern Africa generally lags with smartphone penetration through biggest growth in internet penetration is expected to come from African countries in coming years.

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
3. More skilled and productive workforce.

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.



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.

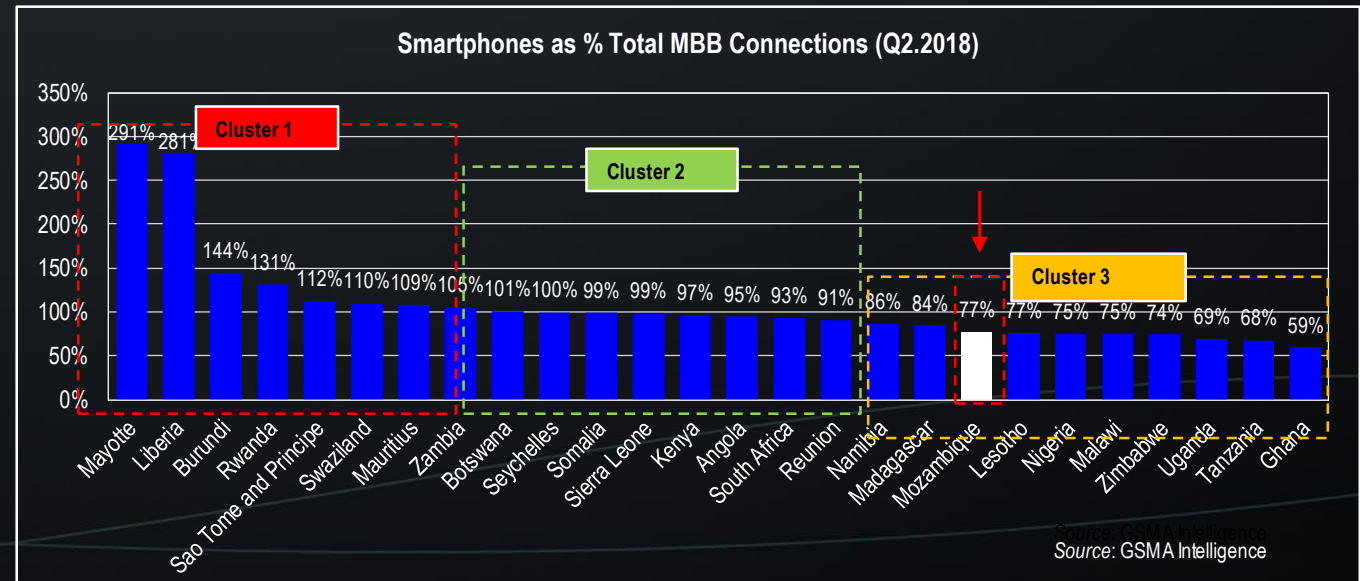
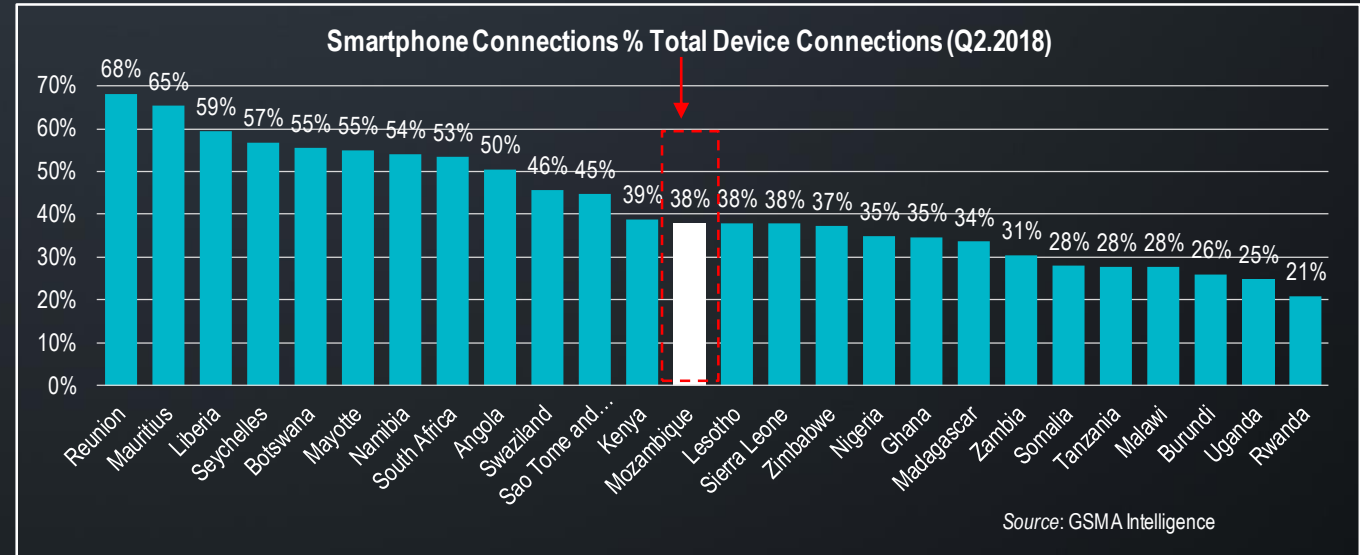
### MBB Connections versus Smartphone Uptake Categories

**Cluster 1:** Countries have more smartphones connected than 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.**



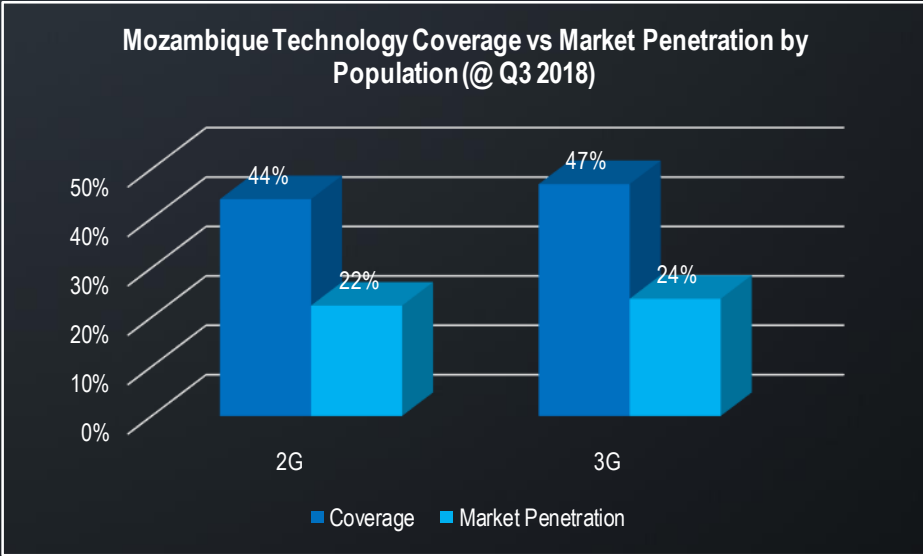
# Mozambique MBB & smartphone market has much room for development

Of the 30,7m people in Mozambique, 57% of population remains unconnected with 73% not utilizing mobile internet <sup>GSMA-I</sup>

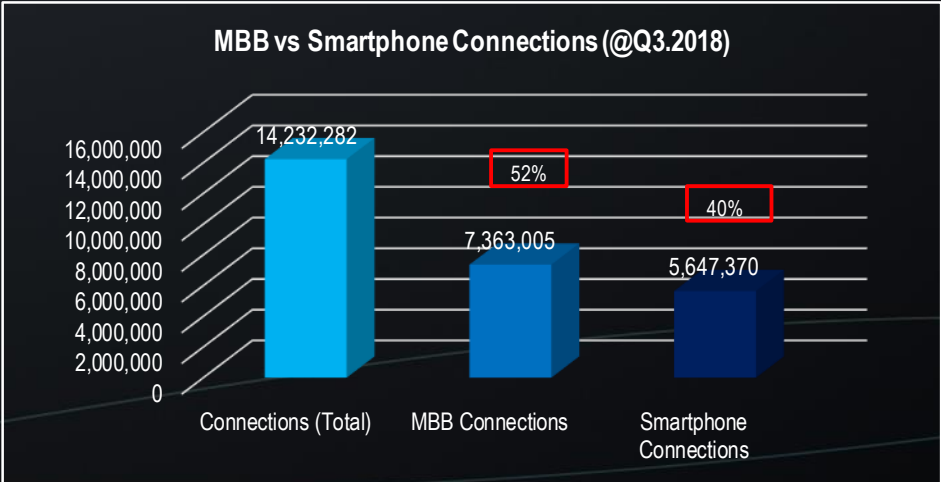
- This means around 17.5 million ppl remain unconnected with 65% of population being rural – bulk of 17.5 million likely to be rural dwellers.
- Only half (52%) of connections utilize MBB SIM cards <sup>GSMA-I</sup>
- Of those 7.4 million MBB Sim connections, 77% are in smartphones <sup>GSMA-I</sup>
- 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.



Source: GSMA-Intelligence



Source: GSMA-Intelligence



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# 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:

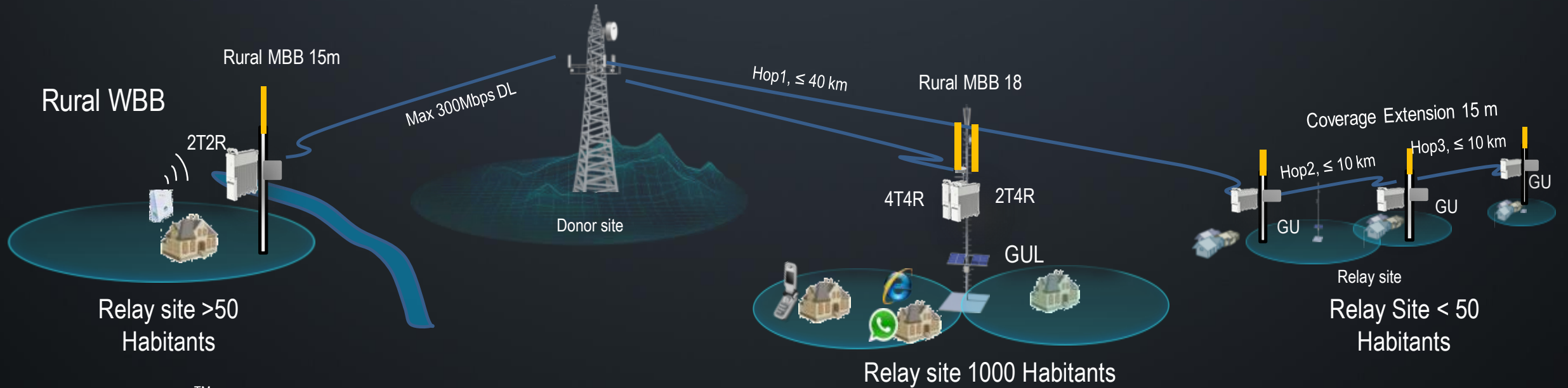
- Delivers Low-band LTE Relay allowing single-hop transmission distance up to 40 km
- Move from diesel generators for power supply to alternative power sources - runs off solar power
- Relies on 12-m high poles (not larger/expensive macro sites).

### Benefits

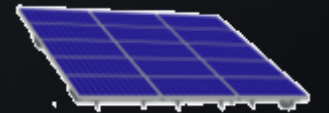
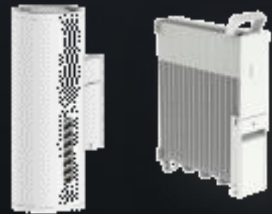
- ❖ Construction costs ↓ 70%
- ❖ ROI in around 3 years
- ❖ Relay technology connects sites <= 40 km distance
- ❖ Substitute for MW & costly traditional satellite narrowband transmission.

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



RuralStar™



## 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.

For carriers



For citizens



## 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.

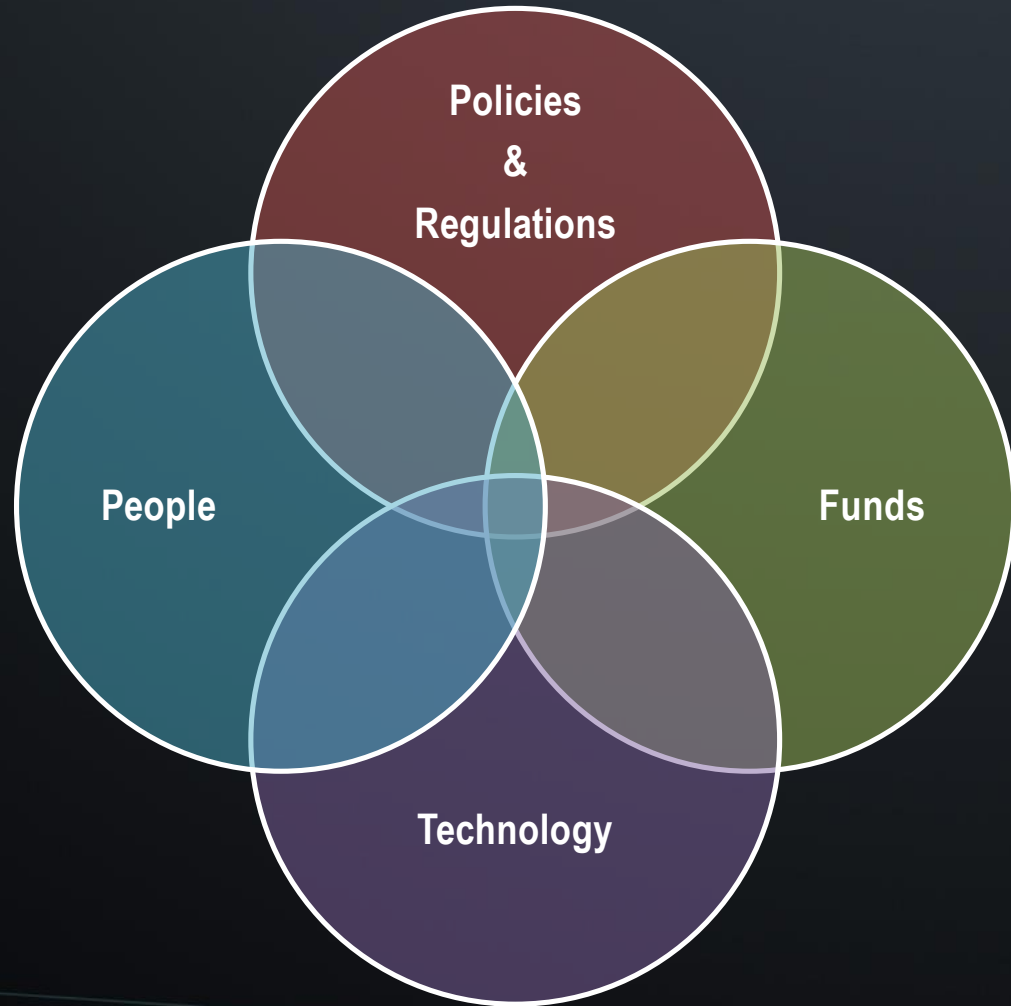
**Benefits for both operators who can reduce time taken to payback investment costs for rural sites while citizens benefits from connectivity.**



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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.)

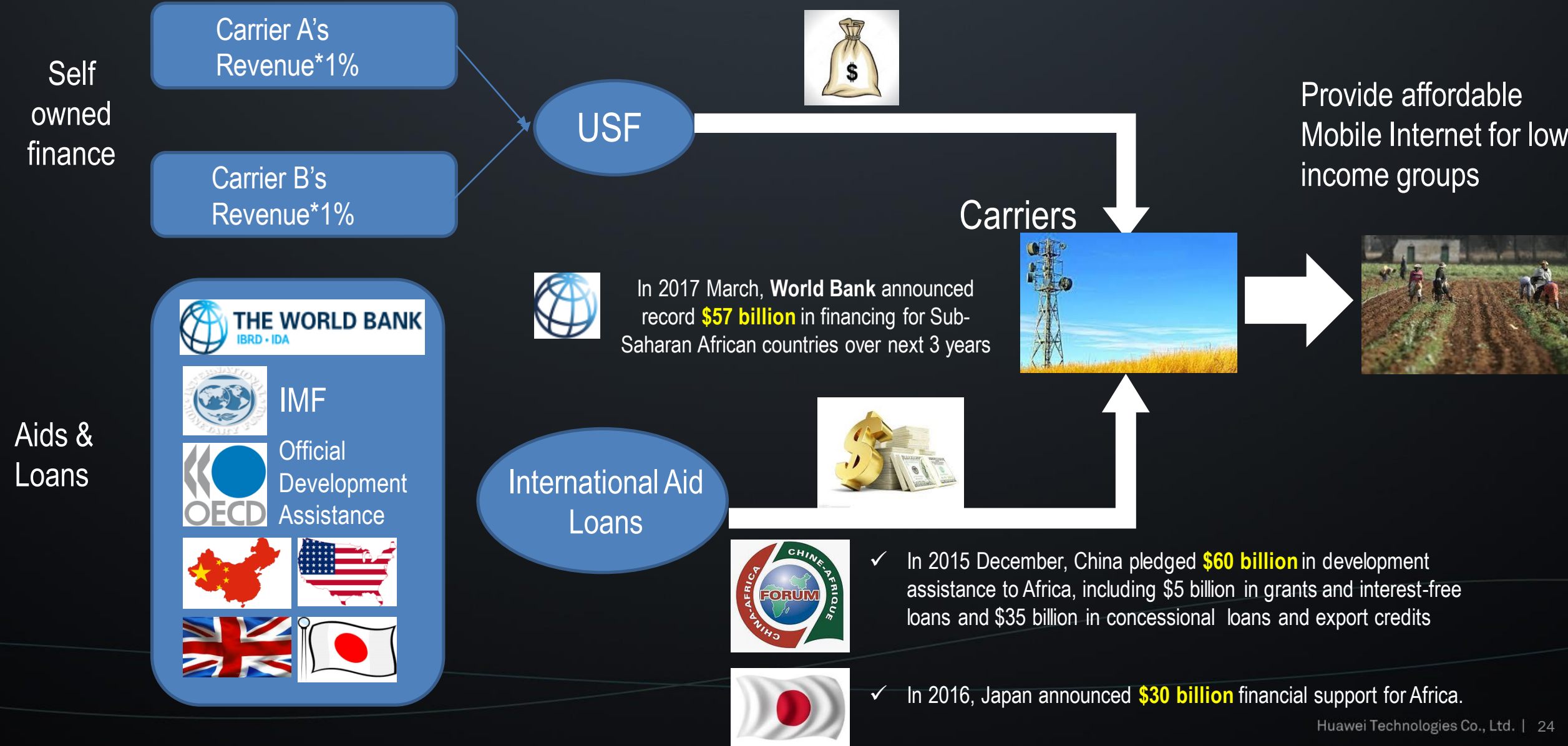
## Accessibility



### 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





# 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.)

Determine USF and other funding models available for rural site development including PPPs.

***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.

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