



PART ONE

ESCCOM USAF

Strategy Review

D1: STRATEGY APPRAISAL REPORT

November 2020

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PART 1

ESCCOM USAF Strategy Review

D1: Strategy and Appraisal Report

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1. EXECUTIVE SUMMARY

As the first Universal Access and Service Strategy comes to an end in 2021, the UAS Committee, together with the Commission are taking stock of the learnings, the successes and the challenges in the implementation of the 2018 – 2021 Strategy. This report has a dual mandate; firstly, it is to review, appraise and acknowledge the successes and challenges of the 2018 – 2021 Strategy and secondly to use the learnings from the first strategy to craft the second strategy which would take the UASF and the UAS Committee into the next three years of Universal access and service.

The appraisal report explores the fundamental frameworks of the universal access and service, this is done through the assessment of the legislative and regulatory frameworks. The 2018 -2021 strategy was set within strategic pillars that would guide the kind of impact the strategy ought to have on the citizens of Eswatini. The analysis of the impact of the strategy on affordability, accessibility and availability.

The access gap analysis that was conducted reviewed the population coverage for 2G, 3G and 4G networks across the Kingdom. The access gap shows that there have been significant gains made in the coverage of Eswatini with technology that can deliver on the UASFs objective of high quality fast broadband connectivity. The Access Gap found that the biggest gap was in 4G coverage, while 3G coverage was sufficient. The outcomes of the model show that the implementation of any network expansion will be for 4G coverage.

Some of the gaps observed in the appraisal are of institutional collaboration and leveraging various institutional arrangements to ensure a harmonised approach to accessibility and digitisation. The network coverage gaps that were observed in the crafting of the first strategy have since decreased significantly, this is evidenced by the increase in coverage and shift in the access gap. Bearing in mind the findings of the gap analysis, the UAS programme defines the activities that the UASF will fund over the next three-year period from 2021 – 2024. There are 5 programmes identified:

- Programme One: Connectivity and Equipment (Demand side measures)
- Programme Two: Management of the Universal Service Committee
- Programme Three: Network Infrastructure enhancement and last mile access to broadband internet (Supply side measures)
- Programme Four: Digitisation and Content Development (Usage and Uptake)
- Programme Five: Digital Literacy, Capacity Building and Training

These programmes are detailed in the UAS Strategy 2021-2024 and are to be implemented by the UASF with the support of ESCCOM, and other government and industry stakeholders. These programmes bring the UASF, the Commission and the Kingdom of Eswatini close towards ensuring ICT services are made available, accessible and sustainable for EmaSwati to use. The UAS Strategy therefore encourages sector stakeholders with interests in either deploying ICT infrastructure to collaborate to fill identified infrastructure gaps, avoid duplication of effort and stimulate demand for the ICT services.

The programmes identified form only a “part” of the UAS Framework as the framework consists of many “parts”, all of which needs to have some form of alignment in order for the “parts” to achieve success. These “parts” include policy and regulatory frameworks, institutional frameworks, various Ministries, the Commission and the Fund. The UAS strategy herein, sets forth targets the carry the advances made in the previous strategy for universal access and improved network technology to support high speed broadband. Institutionally one of the main gaps was inter-institutional coordination with rolling out infrastructure and increasing connectivity. At the regional and Tinkhundla level it is important to develop a culture that will stimulate and sustain a culture of ICT knowledge and use. The three-year programme in the second strategy aims to bring home the use of ICT to EmaSwati through digitisation and the creation of local content; to support uptake and usage of ICT services.

2. INTRODUCTION AND OVERVIEW

2.1 Overview

The Eswatini Communications Commission (“ESCCOM”) is the regulatory body responsible for the Communications sector in the Kingdom of Eswatini (“Eswatini”). ESCCOM is mandated to regulate electronic communications, postal services, broadcasting services, the use and allocation of radio spectrum in the public interest. As part of the mandate, ESCCOM is charged with managing the UAS Fund to facilitate universal access and service to all in Eswatini. The Commission’s mandate is guided by the legislative prescripts of the Eswatini Communications Commission Act, No. 10 of 2013, and the Electronic Communications Act No. 9 of 2013 (‘the ECA’), as well as the regulatory provision of the all the published regulations.

A vibrant, innovative and competitive ICT market has the potential to contribute to increased investment in infrastructure, services and applications, job creation and consequently to economic growth. The potential of the ICT market lies in increasing affordability, accessibility and availability of ICTs. It lies in increasing the ability of consumers and end users to use the various services and applications. Ultimately it relies on the achievement of universal service goals and objectives that are enshrined in the policy and legislative framework.

One of the core long term strategic objectives for the Eswatini Communications Commission is to achieve universal access and service to high speed, high capacity, high quality, highly reliable and affordable broadband internet throughout Eswatini. Achieving this takes far longer than the span of a three-year strategy, some strategic tools will have medium term effects (three years), while others will have long-term effects (five years and longer). Hence the current Universal Access and Service strategy (2017 – 2021) is just a starting point, laying the important policy, institutional and project foundations for the Fund to meet its long-term goal (2021- 2024) of achieving universal access and service.

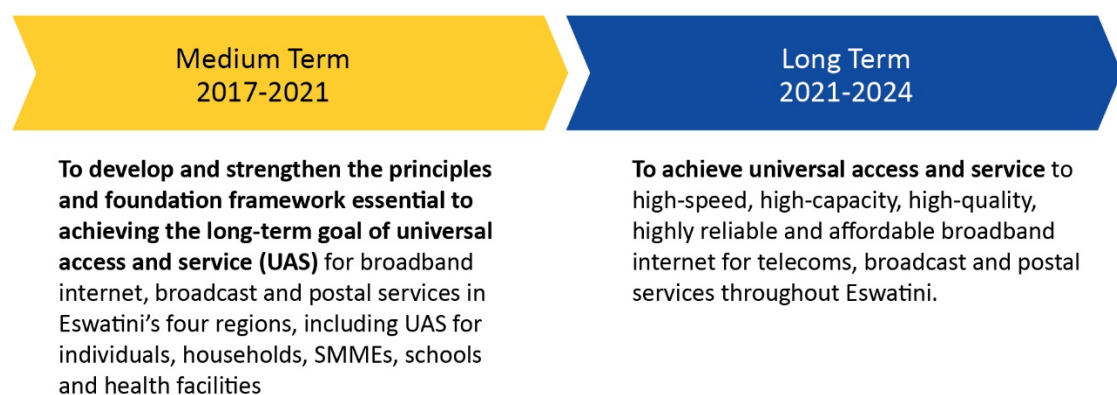


Figure 1: Universal Access and Strategy

As the medium term and first strategy for the Universal Access and Service Fund comes to a close, the Commission has conducted a review of its first strategy implementation. The first strategy was focused on building a foundational framework for achieving long terms sustainable accessibility for all citizens. This report is intended to provide a critical evaluation of the current 2017 to 2021 strategy. This entails considering the:

1. progress made in closing identified market access gaps in relation to affordability, availability and accessibility of ICTS in Eswatini
2. implementation of projects and attainment of the Funds goals and objectives
3. administration and financial management of the Fund
4. ability of the Fund to support national goals and other public mandates

The report assesses the fund through an analysis of ICT sector development over the period (market gap analysis), a review of Fund managed projects, the assessment of audited Annual Financial Statements and an analysis of stakeholder perceptions of the Fund obtained through market research and a National Demand Side Survey. This report is intended to inform the objective and implementation of the new 2021-2024 Strategy.

2.2 Structure of the Report

This report focuses the appraisal of the 2018-2021 universal access and service strategy, the stakeholder perceptions, the Fund administration and finances and the Access Gap analysis. The report is set out as follows:

- Part 1 is the executive summary which sets out the context, key findings and recommendations of the report. The executive summary also introduces the programmes of the new Strategy
- Part 2 is this introduction and background which acts as a guide on the scope and contents of the report
- Part 3 sets out the legal and regulatory framework for UAS in Eswatini, and the roles of key stakeholders
- Part 4 explores the affordability, availability and accessibility assessment
- Part 5 unpacks the findings of the consultative process with stakeholders, Fund beneficiaries and the general public
- Part 6 looks into the Finances of the Fund and the Administration of the fund. This is a review of how the Fund was administered and what the finances of the fund looked like throughout the strategic period
- Part 7 sets out the broadband universal access and service framework within which the UASF functions
- Part 8 is the Market Gap Analysis and the findings thereof. This is an evidence-based approach which informs the proposed UAS strategy

2.3 Scope of this Report

The terms of reference for this project set to achieve the following objectives:

- To determine the perception of the UASF and the strategy amongst institutional stakeholders, beneficiaries of the Fund, Operators;
- To provide an appraisal of the strategy and the implementation thereof;
- To identify, assess, qualify and quantify the Access gap in the market to enable further regulatory action;
- To develop an understanding of the Eswatini market and how best to address the identified access gap;
- To critically review the administrative functions of the Fund and the collection, disbursement and budgeting of the Fund; and
- To review the contributions towards the fund against regional peers.

2.4 Data Sources

In developing the Report, in-depth desk top research was conducted to establish a baseline for the remainder of the work done to develop the National Universal Service and Access Strategy. The data used in the analysis is from a myriad of sources, where available, the most recent 2016 and 2017 data has been used. Key data sources were:

Interview and Discussion Sessions

- ESCCOM executives
- Government ministries and departments
- The operators, EPTC, Eswatini Mobile and MTN

2.5 Document review

- Legislation, regulations and other related ESCCOM documents.
- Documents and reports from the Ministry of Economic Planning and Development, Ministry of Education and Training, Ministry of ICT, the Office of the Prime Minister, ESCCOM, and ESEPARC.
- Written reports and websites of African Development Bank, AfriMAP, EE Publishers, Ericsson, Finmark Trust, Internet World Stats, International Telecommunication Union (ITU), InfoDev, Pygma Consulting's own reports, SADC Secretariat, Stats SA, Telegeography, The World Bank, Trading Economics, UNDP, UNESCO Institute for Statistics (UIS), Open Society Initiative for Southern Africa (OSISA), and USAID.
- A series of other articles, publications and papers noted in the footnotes or text.

2.6 The Importance of Data Availability and Standardised Data

The International Telecommunications Union (ITU), and regional organisations (such as CRASA), set certain useful standards for equipment and also for best regulatory practices. Data availability and data analysis by the ESCCOM, is an important means for ongoing assessment of the market and

contributes to effective regulatory decision-making processes. However, with respect to the identification of access gaps, the key area of analysis for this report, the research team experienced serious challenges in obtaining the necessary data from relevant sources across industry and other institutions. In particular, it was difficult to access data that is comparable and standardised for Eswatini. Furthermore, apart from basic demographic data from the 2007 census and the 2010 Household Survey, development data at the district and sub-district level (Tinkhundla¹ and chiefdoms) was largely not available.

It is essential for the ESCCOM, in co-ordination with the Ministry of ICT, to address this gap in data availability, in order to promote effective, evidence-based regulation. Data analysis is an important strategic tool to compare the geographic reach of telecoms operators and other communications service providers, to provide an historical analysis of access, and to provide data to assess the effects of policy. Availability of reliable data will be crucial to guide the formulation of future regulatory strategy for the broad electronic communications and ICT sector.

It will be necessary for ESCCOM to work with the Central Statistics Office (CSO) to prepare questionnaires and questions specific to the ICT industry to be included in the national census, in household surveys and in other statistical studies for Eswatini. It is also very important that this data be segregated to the Tinkhundla level, in order to provide a more specific geographic analysis in the future. Obtaining data at the Tinkhundla level will enable ESCCOM to better target and recommend areas of priority for UAS projects, and for the deployment of infrastructure. For example, regulatory incentives can be introduced in areas with very low penetration, if data indicates that such incentives will impact on reach and access.

For reasons related to limited availability of relevant data, the model developed for the analysis in this report has focused on the regional level. The availability of standardised and relevant ICT data at the Tinkhundla level is a notable gap.

2.7 The Methodology

The methodology used for this study includes utilization of a series of economic modelling tools such as:

- Access Gap Analysis
- Broadband and Digital Ecosystem Analysis
- Comparison and benchmarking

The access gap analysis methodology is the primary tool utilised while the others are complementary.

¹ Tinkhundla: An inkhundla (plural, tinkhundla) is an area comprising several (about four or five) chiefdoms which, at election time, serves as a constituency area for the election of a parliamentary representative.

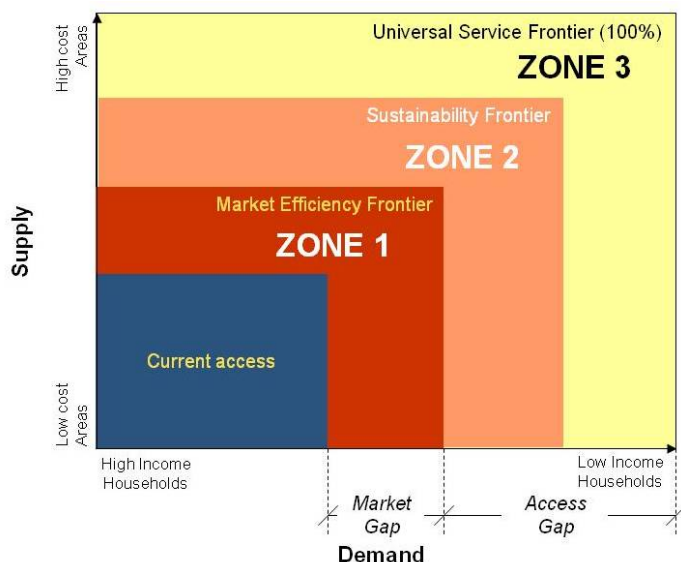
2.8 Access Gap Analysis

2.8.1 Background

Gap analysis in the field of business analysis refers to a numerical method to measure the difference between actual and assumed optimised performance for a key performance indicator (KPI), or set of KPIs, which are measured as quantifiable goals over a period of time. Since optimised performance into the future can be relatively theoretical, use of benchmarks and best practices are used often in the ICT field to define and project optimised targets that are realistic and take into consideration resource allocation. Resource allocation in this analysis includes institutional (including organisational, human and financial factors) and also legal resources, such as policy and regulation.

The gap analysis methodology is a tool to measure how far from ideal performance an organisation is at a particular time, or retroactively to measure how well an organisation has performed over time, and then determine a course of action to achieve its goals. In the field of ICTs, the Access Gap Analysis is a variant of this, oriented towards informing the Government of the necessary performance required in order to achieve a meaningful level of universal access and / or universal service to ICTs. This analysis helps inform the strategy design and related plan of action. The required level of ideal performance by a Government in achieving universal access depends on several factors, both direct and indirect.

- Direct factors are how the organisation responsible for achieving universal access/ service funds and implements interventions that will have an impact in making ICT services more geographically available, of better quality and affordable. In Eswatini, the mandate for universal access/service rests with SCCOM through the Universal Service Committee (USC) whose main function is to fund and implement a universal access/service programme or plan.
- Indirect factors are a series of related policies, regulations, licence obligations and institutions responsible for fulfilling the mandate for universal service. For example, policies that support competition are seen, according to best international practice, as one of the key enabling factors that promote universal access.



The specific universal access gap analysis used here is based on an economic modelling tool developed by the World Bank, generally depicted as per the *Figure 2*.

Figure 2: Universal Access Gap Model.
Source: World Bank

This model identifies three distinct areas for further analysis to guide modelling:

- **Current access:** This describes current universal service and access in Eswatini and incorporates both demand and supply for ICT services.
- **Market gap:** This describes the level of penetration that can be reached through market means, given the ideal regulatory environment and effective competition.
- **Access gap:** The access gap represents the portion of the market that even under an ideal legal and regulatory environment would not be covered by operators due to, for example, high cost of infrastructure roll-out and/or low-income levels of targeted sectors of the population.

It would have been ideal for the research team to collect data at the Tinkhundla level, in order to provide a more detailed geographic picture of levels of access, however this was not possible, because the various sources approached were not able to provide such data. The gap analysis is presented primarily at the level of the four regions, using some projections from national data when regional information was not available. Examples of this are:

- urban vs rural population,
- electricity access,
- poverty levels,
- household expenditure levels, and
- specific network deployment.

2.8.2 Broadband and Digital Ecosystem Analytical Approach

The broadband ecosystem approach is a complementary analytical tool to the universal access gap model. The broadband ecosystem includes four key pillars – high speed networks/ infrastructure, services, applications and users. A holistic approach to universal broadband access must include all four elements. Defining broadband to include both the supply and demand sides of the market also leads to a rethinking of approaches to spur broadband access and use. It is critical to create an enabling environment for supply-side growth in terms of access to networks and services—but is also important to facilitate demand for and adoption of broadband.²

2.8.3 Approach to Developing the Broadband Ecosystem

The inner core of the broadband ecosystem is comprised of four essential elements: users, high speed networks, services and applications. The outer layer represents the type of interventions and investments required which inform strategic interventions adopted by a country.

² “Building broadband: Strategies and policies for the developing world” Yoongsoo Kim, Tim Kelly, and Siddhartha Raja *Global Information and Communication Technologies (GICT) Department*

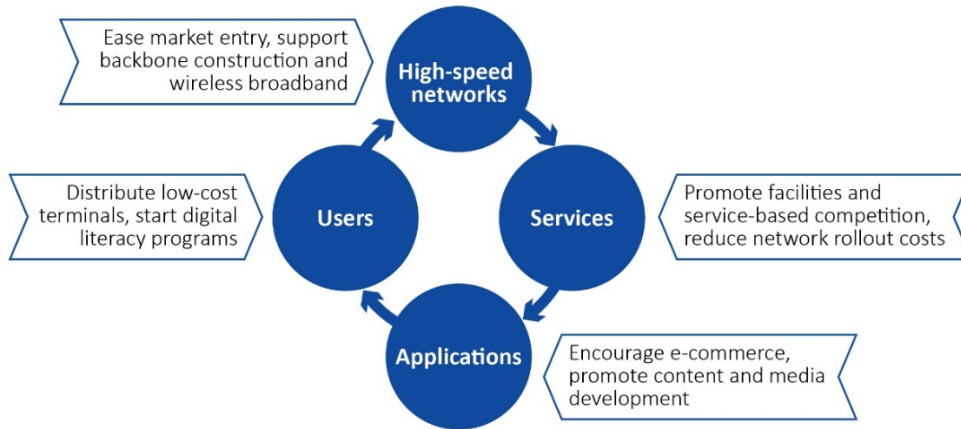


Figure 3: The broadband ecosystem.
Source: World Bank

A complementary framework is the digital ecosystem framework which goes beyond networks, services, applications and users, as depicted in the broadband ecosystem, and includes key aspects of user interfaces, and platforms. Importantly broadband, and a well-developed broadband ecosystem are a foundation for digital transformation.

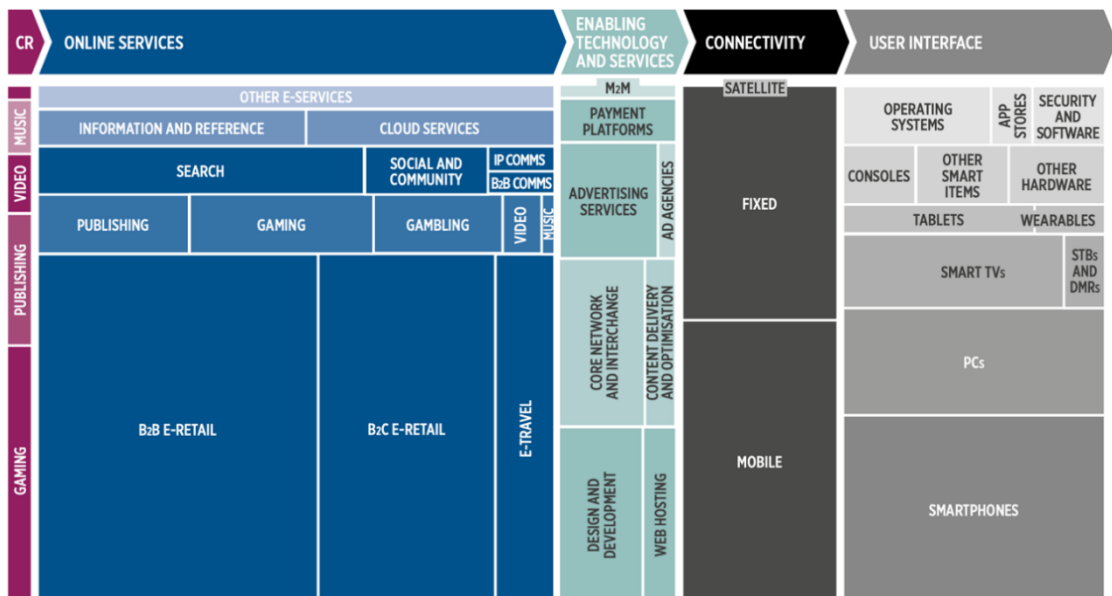


Figure 4: The digital ecosystem
Source: GSMA

2.8.4 Benchmarking

Benchmarking and comparative analysis are tools used throughout the report to provide context and global standards to explain key concept. It is furthermore used to provide context for some of the proposals and recommendations put forward in this report.

3. LEGISLATIVE AND REGULATORY REVIEW

3.1 Purpose

This section of the report provides an overview of the legislation and regulatory framework that support universal Access and Service in Eswatini. It also provides an overview of the institutional framework that has been established to facilitate this. This is key context for the evaluation of the implementation of the UAS strategy and to inform proposals around future strategic options for delivering universal access and service in the country.

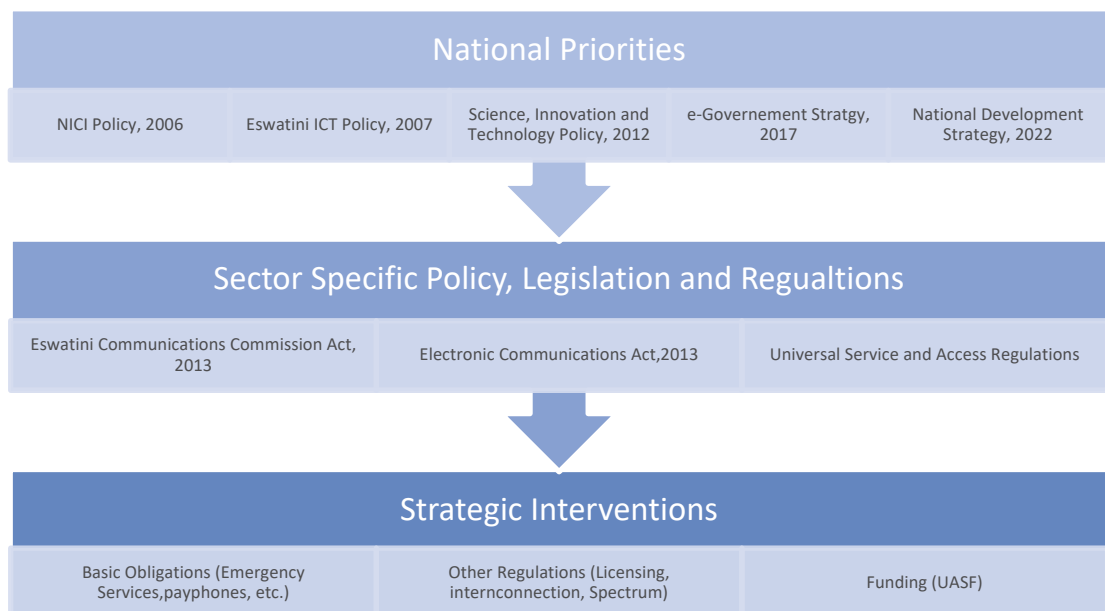


Figure 5: NICI Policy, 2006

3.2 The National Policy Framework

The use of ICT for the development of Eswatini from a socio-economic perspective is guided by a number of government policies, as follows:

- The National Development Strategy (NDS) of 1999, which forms the basis of the National Information and Communications Infrastructure (NICI) Policy of 2006, and the NICI implementation plan for 2012-2016.
- Eswatini ICT Policy of 2007
- Science, Innovation and Technology (SIT) Policy of 2012
- The Eswatini e-Government strategy (2015 – 2019)
- National Development Strategy - Vision 2022

The policy framework has evolved over the years to recognise the importance of broadband as a key driver to unlock the potential of the Eswatini economy, and to spur social development. The Eswatini e-Government strategy in particular puts broadband at its centre and offers a number of opportunities

for partnerships that ESCCOM could pursue to support it. The chart below sets out an overview of the e-Government strategy.

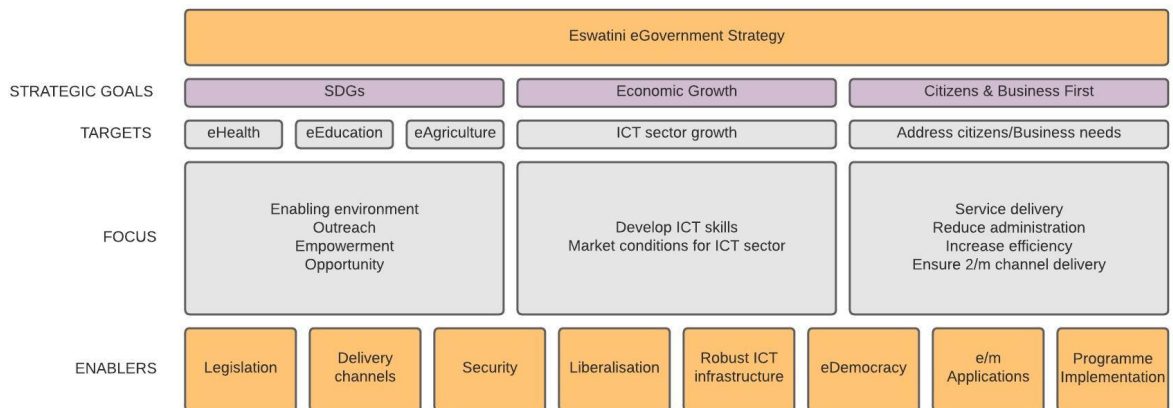


Figure 6: Eswatini eGovernment Strategy

3.3 Legislative Framework

3.3.1 Overarching Legal Framework

The liberalisation of the Eswatini telecommunications market began in earnest in 2013 with the passing of legislation providing the foundation for market reform. This enabled a number of processes to be initiated to transform the market and make it more competitive and efficient.

The Eswatini Communications Commission is the newest regulator in SADC. It was established in terms of the Eswatini Communications Commission Act, No. 10 of 2013 and took over the market regulatory functions from the Eswatini Post and Telecommunications Corporation ("EPTC") in July 2013. Telecommunications sector supervision falls within the competency of the Ministry of Information, Communications and Technology ("MICT"). ESCCOM is responsible for regulating and supervising the operation of electronic communications networks and the provision of telecommunications services.

The Electronic Communications Act, No 9 of 2013 ("the ECA" or "the EC Act"), provides the framework for development of electronic communications networks and services in Eswatini. It sets out the legislative framework for regulation of the telecommunications sector in Eswatini. Among other things, it defines the requirements for the operation of public and private electronic networks, including:

- the rights and obligations of the licensees;
- responsibilities of licensees with dominant market position;
- universal service obligations; and
- radio frequency spectrum management and management of numbers (collectively, ICT resources).

The main objective of the ECA is to establish the groundwork for further market liberalisation and the introduction of competition. This includes the privatisation of the EPTC, a wholly government owned

corporate body established under Act No. 11 of 1983. The EPTC Act also provides EPTC with exclusive rights to establish, construct, maintain and operate the national telecommunications backbone infrastructure in the country. All other operators in the market are allowed to establish their own last mile infrastructure and interconnect to EPTC at rates regulated by ESCCOM.

The mandate of the Eswatini Communications Commission in terms of the ECA includes:

- Management of spectrum and numbering resources,
- Radio frequency spectrum licensing, monitoring compliance and enforcement,
- The regulation of electronic and radio communications apparatus and equipment authorisation (type approval); and
- Regulation of universal service and access, through amongst others
 - establishment and running of a mandatory Universal Service Fund (“the Fund”) and
 - coordination with the “Rural Access Fund”, as may be applicable.

3.3.2 Legal Provisions for Universal Service and Access

Chapter VI of the ECA sets out legislative provisions for universal service and access in Eswatini. “Universal service” is defined in the legislation as “a minimum set of services of specified quality which is available to all users regardless of their geographical location, and in the light of specific national conditions, at an affordable price as may be defined under regulations”. As discussed later in this report, this generic definition does not provide sufficient guidance for a universal service strategy, hence the current strategy drew upon other regional and national targets to supplement its universal service and access goals and objectives.

Section 29(1) of the EC Act states that the Commission, in consultation with the Minister, must “develop annual objectives with the purpose of ensuring that ... services... are made available at the quality specified to all end-users in Eswatini, including those with disabilities, independently of geographical location and ... at an affordable price”.

Section 30 of the ECA sets out the elements that constitute universal service. These include a fixed connection to the public telephone network at an affordable price upon request (including voice, facsimile communications and data communications), a directory of subscribers, a telephone directory enquiry service, access to public pay telephones and measures for users with disabilities and low-income users. These are all carried into the Universal Service and Access Regulations (2016) which provide detail on how these obligations are to be implemented. The Broadband Policy, which is still in progress, is expected to provide guidance on an updated view of universal service and set out the service and access targets for the country bearing in mind the current move towards next generation technologies in Eswatini, in the SADC region and globally.

The ECA creates two funds to finance universal service and access, namely:

- A Rural Access Fund, funded by government and donors (this fund may be created if there is an identified need); and
- A mandatory Universal Service Fund (“the Fund”) which is funded from contributions from operators – currently set at 0.5% of an operators’ net operating income, but which may be increased to an amount which may not exceed 2% of net operating income.

On the administration of the Fund, s.29(3) of the ECA provides that the Minister on recommendation from the Commission shall appoint a committee of not less than 5 and not more than 7 members to implement the universal service and access obligations. The first cohort of this Committee has just completed its term, and a new Committee shall be announced shortly.

3.4 Regulatory Framework

The Universal Service and Access Regulations (2016) inform the approach to be taken and what can and cannot be considered a UAS project or initiative. In the absence of a detailed universal service definition, or national broadband policy or policy on universal service and access, the regulations are particularly important. The regulations provide that universal service obligations (USOs) and funding developed by the Commission may apply to any or all of the following categories of ICT service and infrastructure:

- a) Voice communications services,
- b) Data communications services,
- c) Infrastructure for the provision of voice or data communications services,
- d) Equipment and end user devices; and
- e) Training and skills development.

Furthermore, persons eligible to receive subsidies from the Universal Service Fund, subject to Fund projects and priorities as determined by the Commission, may include:

- Persons with disabilities,
- The elderly / recipients of social grants; and
- Schools, higher education institutions, state hospitals and state health facilities.

Priority sectors in Eswatini for ICT connectivity can thus be understood to be education and health, in line with the e-Government Strategy, as well as rural and underserved areas. Furthermore, both voice and data (broadband) are considered important for growth and development. However, the regulations do not go as far as determining universal service targets for these services.

3.5 Regulatory Trends and Challenges

3.5.1 Recommended Approach

A recommended phased approach from the Eswatini perspective using the broadband ecosystem and digital ecosystem analysis is proposed as follows:

1. Policy and regulatory interventions that would require a national strategic approach to universal access/service to ICTs by both the Ministry of ICT and ESCCOM:
 - Ease of market entry for any ICT services through the developing of a licensing scheme, but especially for backbone infrastructure;
 - Development of an Open Access Policy (OAP) that will guide and oblige cost-based co-location and sharing of infrastructure;

- Development of a generous technology neutral policy of liberalisation in the backbone market, in both fixed and wireless markets including for the licensing of construction of backbone infrastructure by any other operator;;
 - Providing guidance and support for standards through either co-investments with EPTC;
 - Organisational and corporate restructuring of the EPTC into a modern organisation serving the interests of the public, including consideration of its whole or partial privatisation;
 - Facilitate investment in backbone networks through the Fund, tax incentives or other fiscal incentives;
 - Support and promotion of development of wireless broadband as complementary to the fixed broadband network; and
 - Strengthening of competition in the sector by developing capacity for monitoring and compliance, including but not limited to fast-tracking resolution of complaints related to competition;
2. Strengthen entrepreneurial and government content related activities in e-commerce, media development, development of applications, portals and content for e-Government, e-Learning, e-Health, e-Agriculture, e-Tourism;
 3. Encourage investment in the local manufacturing of terminals and devices and lowering or eliminating tax for imports of ICT equipment and user ICT equipment; and
 4. Coordinate with the Ministry of Education in relation to the development of ICT education and strengthening of centres such as the RSTP.

There are further complementary model ecosystems that link with a good broadband ecosystem; however, they are best suited to more highly developed networks and will only be used sparingly throughout the analysis, these are:

- Digital financial services ecosystem;
- Internet of Things (IoT) Data ecosystem; and
- ICT ecosystem.

Universal access requires that an institution such as the ESCCOM is able to rapidly respond to technology developments. The Commission is in some ways fortunate as it can begin to predict future regulatory challenges it might face by considering current trends in more advanced ICT environments. These include:

- Regulation on the Internet of Things (IoT), which comes as a result of the development of network platforms based on Internet Protocol version 6 (IPv6). The IPv6 standard will only be deployed in Eswatini in the next few years but ESCCOM can already prepare for the likely need to introduce IOT linked regulations.
- Provisions to reinforce cyber-security and protection of intellectual property and privacy; and
- Interventions in areas such as big data, big data, cloud security, data storage, tactile internet, location-based services, mobile money, smart cities, etc. The ITU is already advancing an agenda of regulatory standards in such fields under the theme of Technology Watch³.

The following key trends and/or regulatory approaches are useful to take note of:

³ <http://www.itu.int/en/ITU-T/techwatch/Pages/default.aspx>

3.5.2 Broadband investment

- Capital expenditure on fibre infrastructure is expected to surpass USD 200 billion by 2022.
- More than 40 operators have launched or are planning LTE-A deployments worldwide; 88% of these operators are in developed markets.
- The rise in consumer data consumption may spur more Wi-Fi investment.
- Increasing numbers of existing operators, new entrants and financiers are developing alternative funding approaches for broadband network investments.
- Investment in broadband infrastructure is also coming from more unlikely institutions such as hedge funds or corporates that do not traditionally invest in telecoms infrastructure.

3.5.3 Network Sharing

- When network coverage becomes less of a competitive differentiator, operators may need to consolidate networks (through network sharing) as a means of moving away from infrastructure investment and towards developing innovative services.
- Governments currently allocate spectrum mainly on a dedicated basis. New dynamic spectrum access (DSA) technologies allow devices to use spectrum where it is not being used in a particular geographic area, or at a particular time.
- Network sharing can have many benefits but is not without risks, such as reduction in competitive intensity; potential for collusive dealing; and reduced options for services-based competitors.

3.5.4 Internet of Things

- The simplest IoT technology -- passive RFID tagging -- is already widespread in retail, transit ticketing and access control. Near-Field Communication (NFC) is now included in newer smart phones, enabling applications such as contactless payments.
- More complex M2M systems can send information over cellular networks. Examples include electricity meter readings sent to energy companies and car airbag deployment notifications sent to emergency services.
- IoT technical standards have evolved from a variety of different applications and stakeholders with different aims and requirements, and more work is needed to integrate different standards frameworks. A uniform network of “things” is unlikely to develop in the medium term. Some networks will use public infrastructure, others will be entirely private. Some applications will have high bandwidth and interactivity requirements (such as video surveillance); others may focus on transferring short bursts of information (such as smart meters).
- For IoT to become ubiquitous, the cost of tags, sensors and communication systems need to fall to a level where they are a very small fraction of the total costs of the objects to which they are attached.
- High reliability levels and adequate security also become important in large-scale systems that can include thousands of sensors, devices and readers.
- A further privacy issue relates to the amount of personal information that can be derived from seemingly innocuous sensor data, especially when it is combined with user profiles and data from other sources.

3.5.5 Interoperability

- The concept of ‘interoperability’ is much broader than just technical compatibility, with implications across all four key levels – technological, data, human and institutional.
- Systems can increase interoperability by:
 - providing greater opportunities for technical interconnection.
 - being more open about the types of systems and services that can interconnect.
 - supporting a greater variety of data; and by
 - making it easier for humans to leverage the interconnections.
- Interoperability can also increase opportunities to exploit the system. A system that has more points of access allows for:
 - more ‘types’ of system to connect,
 - data processing with fewer limitations;
 - increased potential attack vectors; and
 - more opportunities for nefarious actors to exploit data or to inject bad code.
- Increased levels of interoperability tend to enhance user choice and autonomy.
- Interoperability is not an end in itself, and doesn’t always have to be maximised. Regulators must work with stakeholders to optimise the level of interoperability necessary to meet their objectives.
- Interoperability challenges include:
 - increased complexity of interoperable systems, which may lead to decreased reliability, with downstream systems increasing reliant on upstream systems
 - Increased homogeneity and less market diversity
 - Decreased privacy because of a rising number of individuals with access to one’s personal information
 - Threats to business models – as higher levels of interoperability are distributed unequally across a market. Some businesses may have a vested interest in maintaining lower levels of interop, allowing them to benefit from customer lock-in.

4. AFFORDABILITY, ACCESSIBILITY AND AVAILABILITY ASSESSMENT

4.1 Framing the Issues

Globally, affordability has been identified as one of the primary barriers to internet access, and particularly to optimal use of ICTs in general. There are two particular costs that a consumer must bear in order to have access to ICT's – (1) the usage costs; and (2) the end user device cost. In determining affordability, the approach generally followed is to assess the costs of ICT access relative to monthly income. Using a national average (i.e., GNI per capita) income does not account for income inequality and the unequal distribution of income found across many countries – however it allows countries to benchmark and track progress at a national level given that country data on income distribution is limited.

From an ICT sector perspective, affordability is often measured against the cost of 1GB of data. While this presents a useful standardised measure, it is important to also understand that the 1GB measure is used as a measure of a reasonable entry level data package based on what consumers can do with 1GB of data (as opposed to the previously used best practice definition of 500MB which was not found to be sufficient data to enable a person to actively participate in the economy).

Bearing in mind the fact that 1GB is a reasonable entry level data package, many countries have adopted broadband policies which define “affordable” broadband access as “1 for 2” or 1GB for 2% or less of GNI per capita/ average month. It has been found that when prices drop to 2% or less of GNI per capita, all levels of income earners, including the bottom 20%, can afford a basic broadband connection. At the 4% and 3% levels, mobile broadband remains unaffordable for the bottom 20% of income earners in several countries. A more ambitious 2% threshold allows a broadband connection to become truly affordable for all income groups, enabling more people to get connected.⁴

What's in a GB?

Noting that several variables will affect actual consumption such as network capacity, speed and location, according to Vodafone UK, roughly, with 1GB of data a consumer can:

- Watch one hour and 20 minutes of video at Standard Definition
- Stream roughly eight hours of high quality music (320kbps)
- Send or receive about 1000 emails
- Send over 1.5 million WhatsApp messages (without pictures or video)

⁴ A4AI

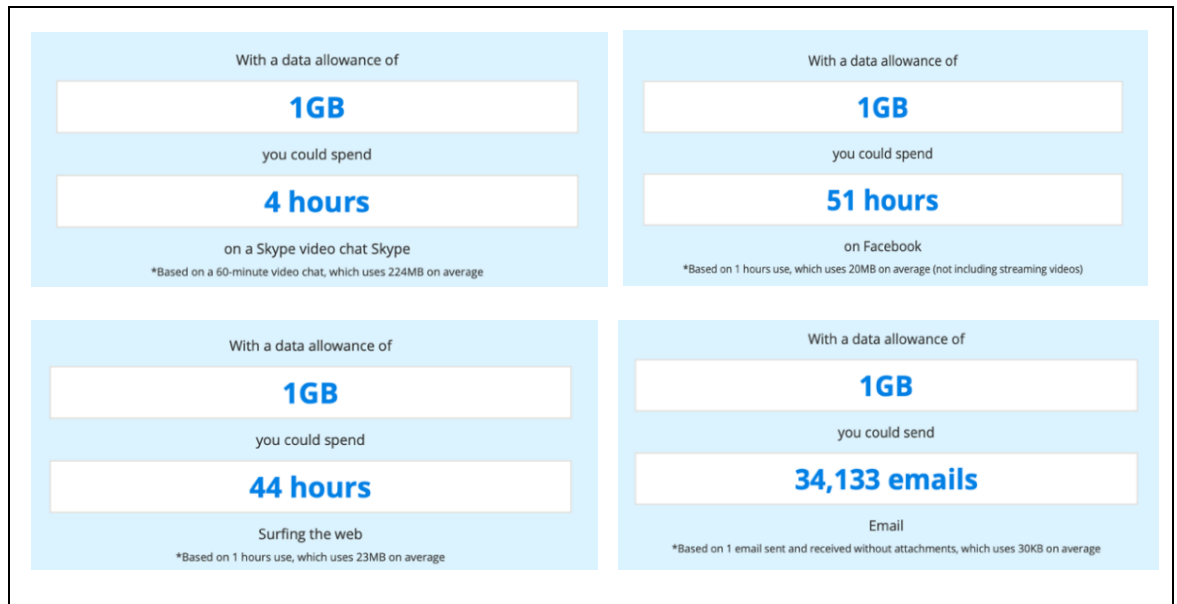


Figure 7:

Source: <https://www.confused.com/mobile-phones/guides/what-does-a-gb-get-you-mobile-internet-data>

4.2 Global Broadband Targets and Performance

4.2.1 Targets

The United Nations Sustainable Development Goals set by the global community in September 2015 called for universal, affordable internet access by 2020 (Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation). As previously indicated, best practice is to define affordability is often defined relative to monthly income. Some key country and regional examples are set out hereunder:

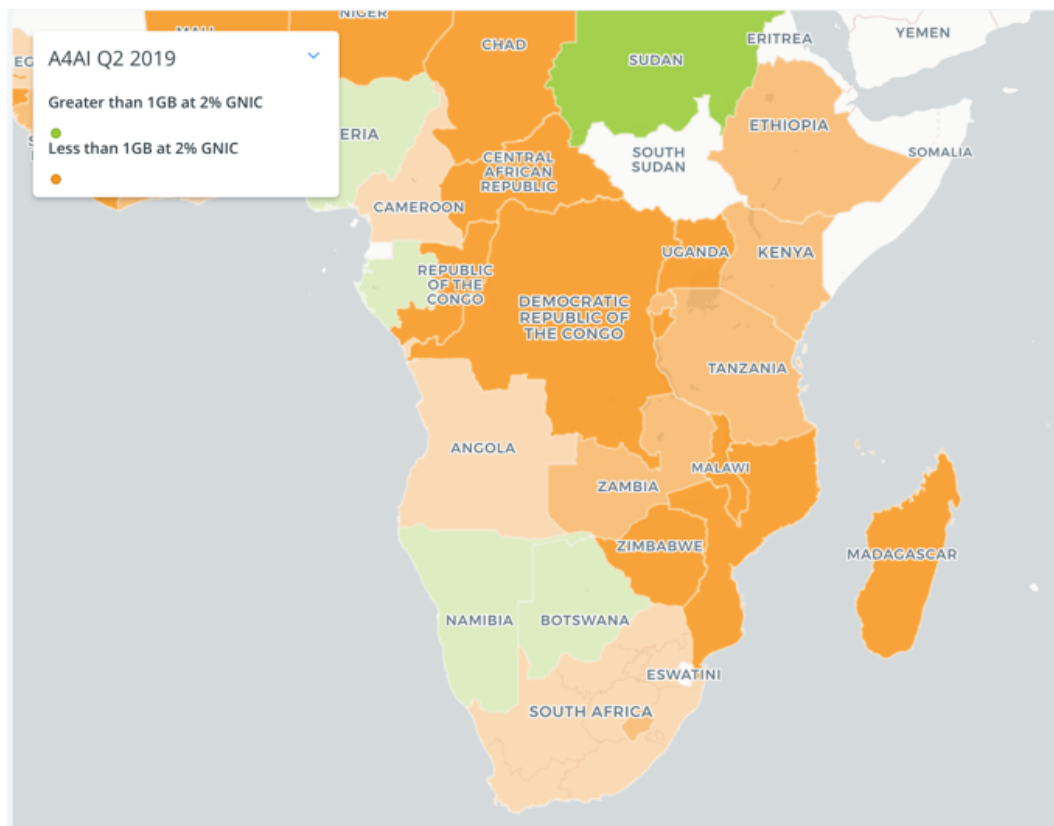
- **EU:** By 2025, entry-level broadband services should be made affordable in developing countries at less than 2% of monthly GNI per capita (EU Broadband Commission)⁵ - this is considered global best practice
- **South Africa:** “The 2020 Vision for broadband is that by 2020, 100% of South Africans will have access to broadband services at 2.5% or less of the population’s average monthly income.” (South Africa Connect, National Broadband Strategy)
- **Kenya:** “This strategy will make broadband affordable to the citizenry in line with the recommended UN broadband commission level of 2% or less of the GNI per capita” (Kenya’s National Broadband Strategy 2018 – 2023)
- **Ghana and Nigeria** define affordable as 1GB of data for 2% of average monthly income.

⁵ <https://broadbandcommission.org/Documents/publications/SOB2018-Chapter3.pdf> . In January 2017, the Broadband Commission lowered the de-facto standard for Internet affordability to 2% of average income, from the previous <5%

4.2.2 Performance

The Alliance for Affordable Internet (A4AI) has developed an Affordability Index which measures 99 countries success in achieving broadband affordability against the best practice definitions of the cost of 1 GB of data relative to GNI per capita⁶. The A4AI index excludes Eswatini, however it is notable that in terms of cost of 1GB of data relative to GNI per capita. The 2019 A4AI index found that:

- Across Africa, the average cost for just 1GB data is 7.12% of the average monthly salary. In some countries, 1GB costs as much as 20% of the average salary.
- Botswana stands at 9.2% of average salary for fixed broadband services and 9% for mobile broadband service (2018);
- in Kenya, during the same period, 1GB of data cost a Kenyan mobile user 4.01% on average of GNI.



*Figure 8: Africa Affordability Index.
Source: Alliance for Affordable Internet*

⁶ https://1e8q3q16vyc81g8l3h3md6q5f5e-wpengine.netdna-ssl.com/wp-content/uploads/2019/10/A4AI_2019_AR_Screen_AW.pdf

4.3 Eswatini Affordability Analysis

It should be noted that no data was assessed for Eswatini in the A4IA analysis. However, two approaches have been used to consider affordability in Eswatini using available data a credible approaches. By both measures the total cost of communications (device ownership and usage) in Eswatini is considered high:

1. using the A4AI methodology, and ITU and World Bank data,⁷ in Eswatini, the average citizen spends 2,37 % of monthly GNI on fixed data and 2,24 % of monthly GNI on mobile. Device costs are high and about 5,8% of monthly GNI is spent on entry-level terminals and household installation for fixed broadband. Eswatini's cost of 1GB at 2.37% and 2.4% of average monthly income, for fixed and mobile data respectively, is below the regional average and in line with A4AI targets.
2. the Eswatini FinScope 2018 Survey provides a breakdown on how the average adult in the country spends money over the course of a month. The spending pattern shows that that cost-of-living expenses (75%) is the main driver followed by productive spending (education and investing in business/farming (12%) followed by insurance (including medical expenses) at 6%. Communication services (e.g. airtime, device costs) are the third highest expense in an average adult's monthly budget at 10%.

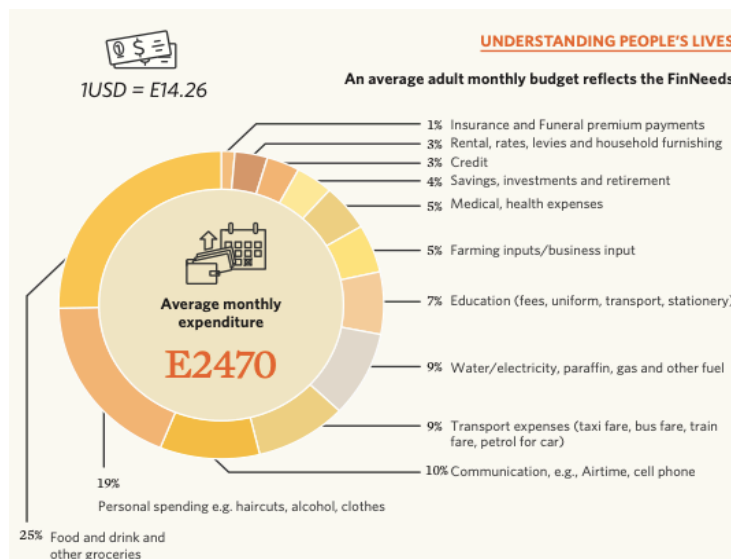


Figure 9: Average adult monthly budget.

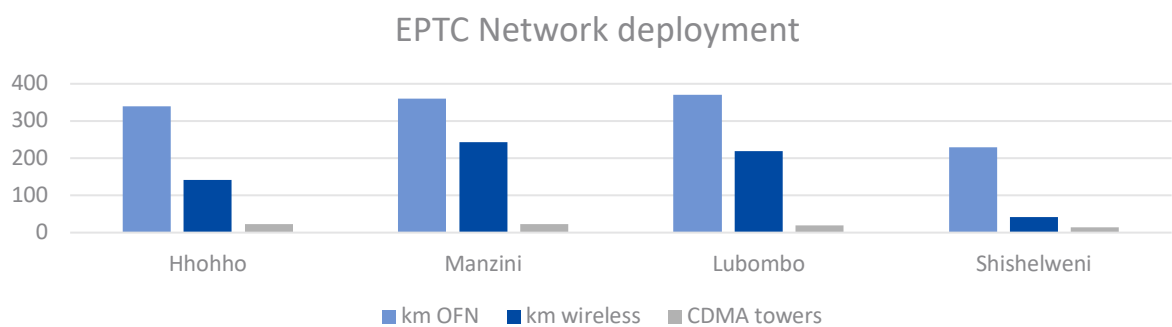
Source: Eswatini Finscope, 2018.

⁷ International Telecommunication Union (ITU) methodology to determine the cheapest handset-based mobile prepaid broadband plan per country. That is, the cheapest plan(s) providing at least 1GB of broadband data over a 30-day period from the largest mobile network operator in each country. The pricing data was collected by A4AI for the second quarter (Apr-Jun) of 2019. Gross National Income (GNI) per capita data is from the World Bank, 2018. No GNI data was available for Somalia, South Sudan, Equatorial Guinea and Cuba. The exchange rates are for Q2 2019 and based on quarter averages from Google Finance and OANDA.com. In some countries, smaller data bundles (e.g., 100MB) are not available and instead we identify the cheapest option to purchase that bundle. This may lead to the same price for several bundles. For example, in Argentina 100MB plans are not available from the largest operator, and so purchasing just 100MB of data would cost the same as purchasing 1GB.

4.4 Eswatini Availability Analysis

As of November 2020, the coverage for Eswatini was as illustrated below. The maps below show that great strides have been made in ensuring reasonable broadband coverage in the form of 3G across the country. The roll-out of 4G is slowly gaining momentum.

4.4.1 Fixed

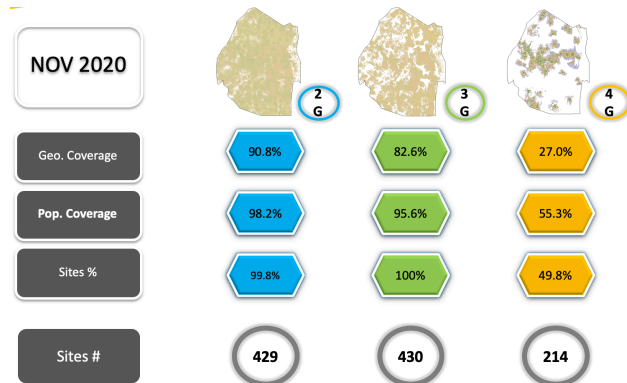
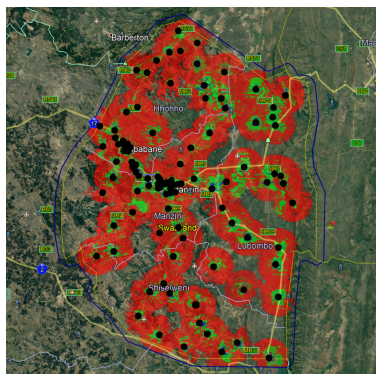


The analysis found that limited fixed network expansion occurred in the period of the strategy. EPTC's infrastructure deployment strategy is similar to the commercial infrastructure deployment strategy of MTN – i.e. focused on Manzini and Hhohho, with lesser deployment in Lubombo and Shiselweni which are less densely populated. Lubombo region has more kilometres of optic fibre network deployed. It is geographically 62% larger than Hhohho and 43% larger than Manzini. This difference is more marked in the case of wireless infrastructure. Shiselweni remains the least connected of all four regions in relation to both OFN and wireless backbone - with 17.69% of the national OFN and 6.37% of the total wireless backbone. Manzini is the best connected region and the hub for the EPTC network. It has high density, urban population.

4.4.2 Mobile

MTN Coverage is used a proxy for national mobile coverage with 2G (429 BTS), 3G (430 BTS) and 4G (214 BTS). However, it is noted that Eswatini Mobile also has 114 BTS and 30 planned. 2G coverage is good at 98.2% population coverage; 3G is also good at 95.6%. It appears that most of the sites are dual band 2G/3G, whereas only half of the sites (of MTN) are 4G. Important to note is that:

- 4G coverage is 53% and represents a gap in terms of achieving access to high speed internet access
- Hhohho and Manzini have the most sites, and highest coverage. They also are the most urbanized regions.
- Geographically, Lubombo and Shiselweni have the fewest sites, despite the fact that Lubombo is geographically 62% larger than Hhohho and 43% larger than Manzini.



5. 2017 – 2021 STRATEGY IMPLEMENTATION REVIEW

5.1 Strategic Objectives and Targets

The initial medium term strategic objectives were to develop and strengthen the principles and foundation framework essential to achieving the Long-term goal of universal access and universal service for broadband internet, broadcasting and postal services in Eswatini. The medium-term period is a three-year period and coincided with the first UASF Strategy 2018 – 2021.

The Long-term objectives are centred around achieving universal access and service to high-speed, high-capacity, high-quality reliable and affordable broadband internet for telecoms, broadcasting and postal services. The Strategy adopted a minimum speed of 4Mbps (downlink).

5.2 Programmes Implemented

The UASF adopted five programmes for the implementation of the 2017-2021 strategy:

Programme One	Connectivity for facilities, such as community centres, schools and health facilities (demand side measures)
Programme Two	Management of the Universal Service Committee
Programme Three	Network infrastructure enhancement for backbone and last mile access to broadband internet (supply-side measures). Priority are Lubombo and Shiselweni regions
Programme Four	Development of Eswatini Digital Access Centres (EDACs)
Programme Five	Universal Broadcasting Access

Figure 10 The UASF adopted five programmes for the implementation of the 2017-2021

The objective of the Programme One is to facilitate broadband connectivity for health facilities and schools; and government-wide connectivity for future e-government projects and programmes using the most efficient last mile technologies with broadband access with a minimum speed of 4Mbps. The programme planned to connect 16 health facilities and provide 22 laptops for ICT for Education. The programme exceeded its targets and met the Key Performance Areas in that under this programme 55 health facilities were connected; 10 specialised laptops were procured for students with special needs and 1755 laptops were procured for ICT in education programme.

Programme two focused on the management and administration of the Fund and Committee. This function includes the cost of management of the Fund and the administrative duties of the Committee. The Committee provided oversight of the management of the Fund and budget and was

responsible for the related monitoring and evaluation of the Fund activities. The programme managed to afford the Committee corporate governance training, technical training and held 12 meetings to review progress of the Fund.

The objective for programme three is to strengthen the network backbone infrastructure, fixed and mobile based on a technology neutral approach, as well as to increase network reliability and redundancy. The programme had planned to establish 30 GSM sites and connect 90 facilities. To date, the programme managed to connect 12 veterinary remote sites, 2 border gates, the King Mswati III International Airport and 6 Tinkhundla service centres. It also established 13 3G and 4G sites, just under 50% of the targeted GSM sites.

Programme four was intended to support the creation of regional ICT entrepreneurial activity supported by local, regional and national educational institutions, NGOs and government. This programme had a target of 8 sites, however despite numerous efforts this programme was not implemented. The implementation plan and sustainability beyond the initial funding from the UASF of the programme was difficult without on-going funding and support from the UASF.

Programme five was intended to support the transformation and expansion of the broadcasting sector, to complement the provision of universal access to multimedia from a of communications and information. This programme was not implemented due to the absence of a legal framework and regulatory guidelines for broadcasting networks and services.

5.3 Challenges and Lessons Learned

The implementation of the 2018 -2021 strategy has overall been quite successful especially given the this was the first strategy period. It has taught ESCCOM a number of key lessons that will be carried into the revised strategy:

- **Importance of effective budgeting** and ensuring that the amount spent on each programme is predefined and adjusted to the desired impact of the programme in the overall strategy
- **The participation of licensees is critical** – programmes need to be designed bearing in mind the incentives for collaboration with licenses, equipment suppliers, NGOs, educational institutions and any complementary institutions.
- **The complementary relationship between UAS programmes and regulatory reforms measures** should be borne in mind at all times to ensure optimal use of the Fund – than has been successfully done
- **Annual review of implementation of the Strategy** is important, the strategy needs to be treated as a living and agile document
- **Identity of the Universal Service Committee and the Fund might need to be developed** to enable an understanding of the mandate, programmes and projects and facilitate an appreciation of the work done and gains made.

5.4 Stakeholder Consultation Overview

As the first strategy of the Universal Access and Service Fund comes to an end, it is important that the UASF Committee, the Commission and the ICT sector gather the reflections of the key stakeholders.

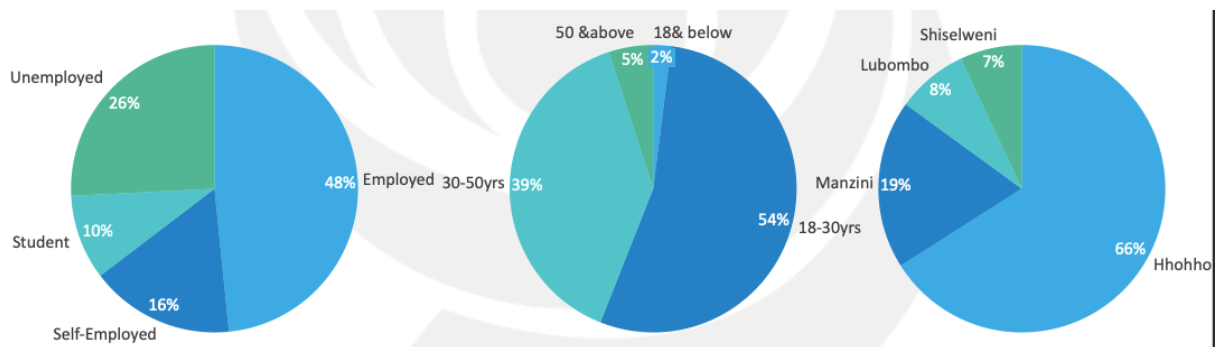
This reflective exercise is intended to shape the future strategy, making it a lot more impactful, and aligned to national socio-economic growth strategies. The stakeholder consultation exercise was intended to understand their interactions with the Fund and the Commission, and how this can be leverage further to achieve greater impact.

5.5 Methodology

The stakeholder consultation adopted a two-pronged approach in an effort to reach the varied intended audience. The audience were the public and private ICT related entities or departments, who were interviewed using a guided questionnaire which was sent ahead of the interview. Each entity was represented by personnel that had previous interaction the UASF and/or was responsible for strategic ICT solutions and implementation. The main objective was engaging the different public and private intuitions and entities on their understanding of the UASF and UAS Strategy, and to determine their interaction and desired collaboration with the UASF and UAS Strategy.

The second type of audience which informed the National Demand Side Survey analysis, was the people of Eswatini who make use of the internet. This was done through a national demand side survey administered by ESSPARC that was completed by ICT users on a random voluntary basis. ESEPARC designed the demand survey to be an online rapid assessment of the public’s perceptions on the ICT sector in Eswatini. It was not meant to be a national survey to represent the various quotas that need to be met in terms population size, enumeration areas, urban versus rural. Instead, the ESCCOM already has a study on the ICT sector, which provides a baseline of the issues of access, types of services, affordability, among other issues. The online demand survey is a rapid assessment to test whether all the findings of the ICT baseline study still hold. Basically, the online demand survey provides a quick overview of the key issues that are prevailing within the general public currently with the caveat that these responses need to be explored further using other research instruments or mechanisms.

This was an online survey that was widely marketed on social media such LinkedIn, WhatsApp, and Facebook. To reach the population outside of the urban areas, the research team also put up posters in bus ranks and community areas in select rural areas of Eswatini to encourage the rural population to participate. The posters included a contact number for those that were interested to participate but had no internet connectivity/means to complete the online Survey. ESEPARC received about 90 calls of which these individuals were contacted and responded to the Survey via a telephone interview.



A total of **224 responses** were received, of which:

- 30% were female and 69% male.
- Respondents who live with a disability were 1.4%.
- 61.3% of the respondents were from rural Eswatini, while 39% were urban areas;

At the outset it is important to note that the sample represents internet users, i.e. those who already have access. It is not nationally representative, nor is it representative of the Eswatini demographics.

5.6 Demand-Side Survey

The demand side survey tested accessibility, usage and the perceptions of affordability amongst end users. According to the survey, it seems that the respondents had sufficient access to internet, broadcasting services and postal services. All three ICT services could be accessed within a 5km radius of the respondent's home both in the rural and urban areas. However, due to the limited sample of the respondents, this is not a statistically representative response; furthermore, it also has a bias as the majority of the respondents were employed.

These findings suggest that the mobile operators and the networks they operate have a greater reach and access to citizens as majority of the consumption is on mobile devices over 3G or 4G connectivity.

The respondent's perceptions towards affordability show that further intervention needs to be done as most respondents were of the view that mobile internet access was unaffordable to a majority of households at the current going prices.

The survey, although not a statistical representation of the national view, showed that there need to be further interventions around affordability. It was not clear from the survey outcomes whether the affordability was linked only to data or connectivity costs, or if this included end user devices. However, it is clear that there is a gap in citizens ability to afford the services.

5.7 Stakeholder Review of the Fund

The stakeholder interviews were intended to gauge the level of interaction that public and private stakeholders have the Fund, the strategic coordination and leveraging of resources to fulfil the socio-economic targets of universal access and service for all ICT services. The interviews were held with the following participants:

Public Institutions	Private Entities
Office of the Prime Minister	Eswatini TV
Ministry of Information Communications Technology	MTN
Ministry of Agriculture and Veterinary Services	Eswatini Mobile
Eswatini Postal and Telecommunications Corporation	Jenny Internet
ESCCOM – Broadcasting	
Ministry of Health	
Ministry of Education and Training	
Royal Science and Technology Park	
Ministry of Tinkhundla and Administration	

Figure 11 Public Institutions

5.7.1 Fund Role in Supporting Health Facilities

5.7.1.1 Project Implementation and Impact

The USAF has played a major role in the health sector, connecting some health facilities to a Wide Area Network (WAN) and donating computers to some. Connectivity of the health facilities aimed to provide an enabling environment for the optimal functionality of the Client Management Information System (CMIS) and other systems within the health sector. The USAF helped the Ministry provide 35 facilities with last mile connection to the government microwave infrastructure and connect 5 facilities to Wi-Fi hotspots through Jenny internet. These include the Lobamba, Luyenyo, Lubombo Referral, and Lomasha health facilities.

Representatives from the Ministry pointed out that the projects implemented under USAF have helped improve service delivery at facility level, improve data sharing between health facilities, record keeping and data quality. This will go a long way towards improving decision making, providing timely reporting and monitoring of all health facilities.

The major challenges experienced during project implementation related to the nature of Eswatini's terrain, as some areas had no high sites to install spectrum infrastructure. For example, the clinic in Lomasha was not connected due to the lack of towers to connect to. There therefore is a need to consider the use of alternative technologies. Representatives from the Ministry pointed out that fibre

could be considered in future connections as it is stable, more reliable and will not be stolen, compared to microwave which is vulnerable to weather disruptions.

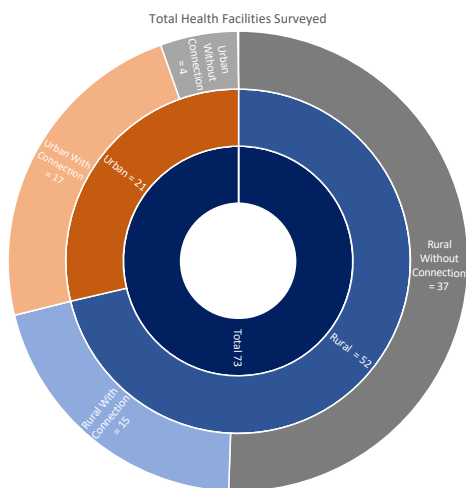
Tower sharing arrangements also present a challenge for the Ministry in ensuring service delivery to all clinics. It was pointed out that the government is currently not considered in tower sharing agreements, yet would benefit from such an arrangement to provide services to remote areas where commercial service providers already have existing infrastructure. It was proposed that the cost-sharing agreement should be reviewed to determine government’s position in cost sharing of infrastructure to provide a public good, as opposed to commercial gain.

5.7.1.2 Connectivity

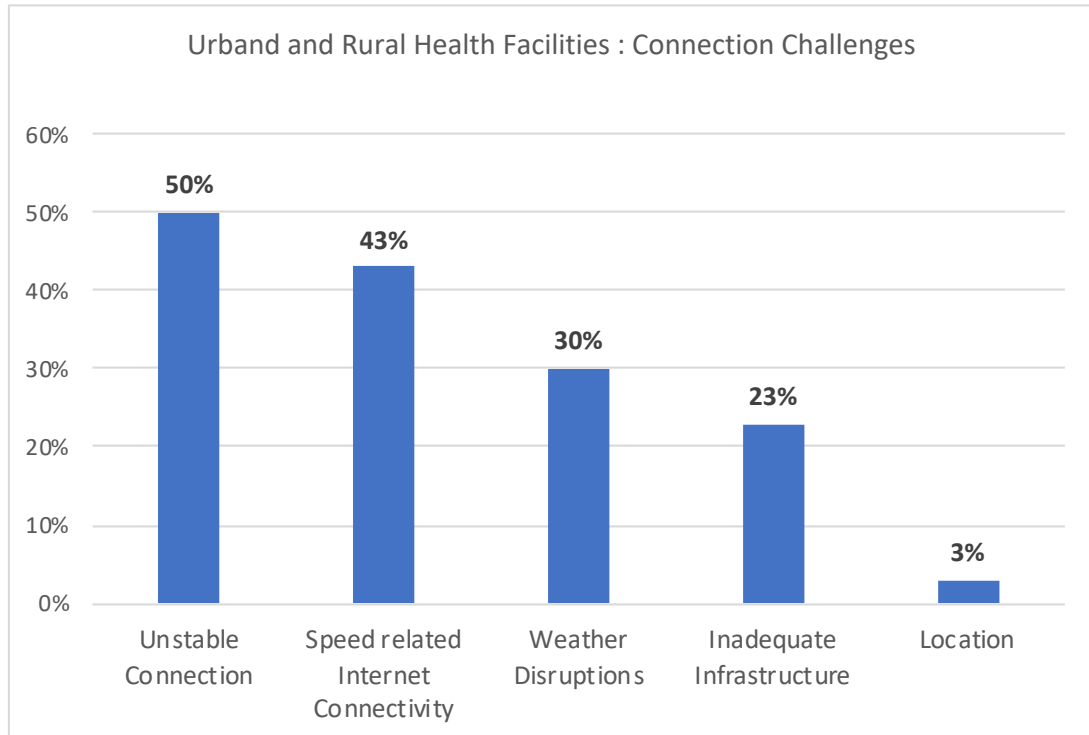
Data from the Ministry of Health – HMIS shows that the country has 341 health facilities both in the public and private sector, of which 105 (30.1%) do not have a WAN connection, and 242 have a connected LAN status. According to the Ministry 55 of these facilities are connected through the support of ESCCOM on EPTC/microwave connection, while others have been funded by the health facility, government, USAID or Global Fund. Table 12 shows that different WAN connections used to connect Eswatini’s health facilities, with microwave connection being the most common.

Type of WAN connection	Number of facilities
APN	14
APN/Microwave	6
Microwave	187
Microwave/EPTC	14
EPTC	6
Government fibre	2
Connected to the Hospital	7
Total	236

*Table 12: Number of Health facilities connected to WAN
Source: HMIS Data (2020)*



A survey with 73 of the health facilities finds that a majority of the facilities that are not connected are in the rural areas.



Of the 52 rural facilities surveyed 37 are not connected compared to 4 out of 21 in urban areas. Health facilities perceive the lack of infrastructure and cost of the equipment and service too high for them to connect. However, the importance of ICT connection is emphasised by all health facilities as very important for administrative purposes and improving efficiency.

Even though a number of health facilities are connected through support of the USAF and other funding institutions they still experience connection challenges. Of the surveyed health facilities an equal number (50%) of urban and rural facilities have an unstable connection (non-frequent or weekly interruptions). Challenges with internet connectivity are largely related to speed (43%), weather disruptions (30%), followed by infrastructure (23%), and lastly location (3%) in rural areas. Despite the fore mentioned challenges the Ministry of health relies on different organisations to sustain and maintain connectivity in most of their facilities. “We are still not yet there in terms of sustainability, thus we rely on high resource mobilisation, we apply for grants, from global fund and others”.

5.7.1.3 ICT needs

All health facilities interviewed in the survey pointed out that their ICT needs will continue to grow in the future. This was corroborated by representatives from the MOH who pointed out that going forward it will be important for the sector to increase not just ICT access to all health facilities but expand internet connectivity beyond administration; to provide free Wi-Fi to patients. The major goal is to ensure that all public and private health facilities are connected to a stable and sustainable network for quality service delivery to support the roll out of the Client Management Information

System (CMIS) to all facilities in the country. Hence the UAS should ensure that network coverage is increased to ensure that there are no pockets of areas where there is no connectivity.

Whereas investments have been made, the Ministry still needs assistance in terms of skills and technical capacity for maintenance and use of equipment. Of great importance is increased access to towers that are close to clinics and hospitals to ensure that government is able to share towers at the lowest costs possible. The Ministry also seeks to invest in a *telemed* project. This project was piloted but not fully implemented because of lack of infrastructure and sustainability of the project.

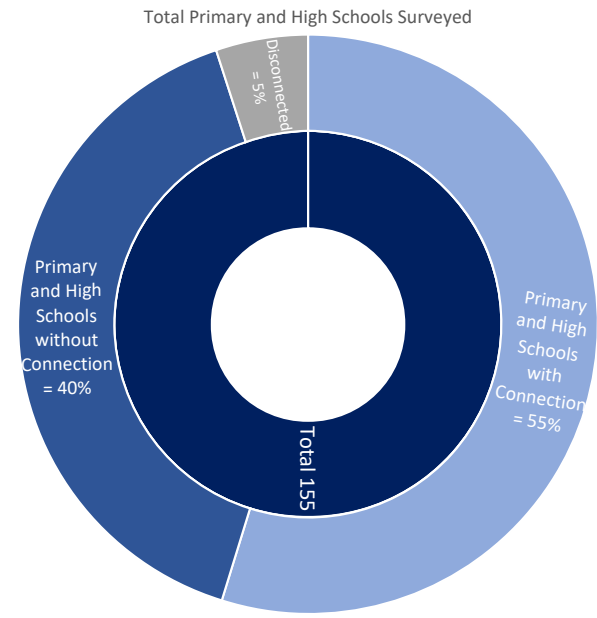
5.7.2 Fund Role in Supporting Schools

5.7.2.1 Project Implementation and Impact

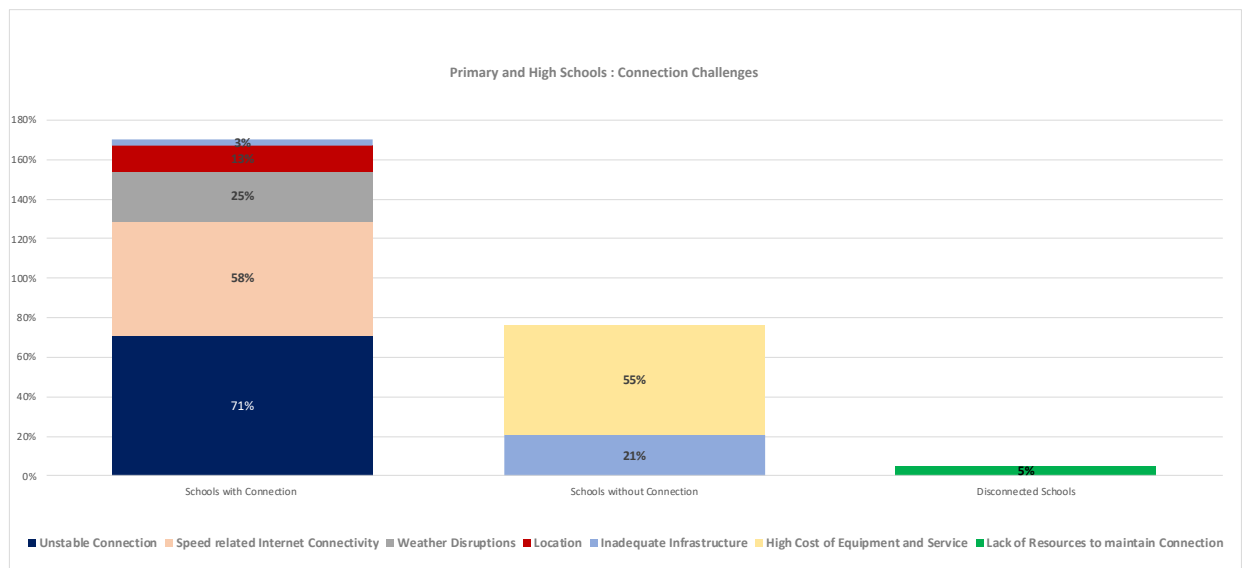
The Ministry of Education and Training (MoET) benefited from USAF through support for ICT as a subject. This focused on the provision of assistive devices for students with special needs. In 2018 USAF procured assistive devices focusing on learners with visual impairment (high school mostly) – bought 10 pro-digi connect-12 devices with desktop and short and long distance magnifiers. In 2020 the fund proposed to support the procurement of interactive white boards and software for teachers to teach literacy and numeracy, it will also assist in developing a second language for the deaf (English, Math). This will also help pupils with reading and writing problems.

The projects implemented through USAF have been impactful for the MoET. Representatives from the Ministry state that students (especially those with special needs) are now motivated to learn, and this has reduced stigma discrimination in the classroom. This has also improved student's performance and motivated teachers to teach students with the right learning material. The major concerns however, were sustainability and cost effectiveness. The MoET raised the concern that the procurement and maintenance of these gadgets was done in South Africa, which was costly, and will delay repairmen processes were students need gadgets to be fixed.

5.7.2.2 Connectivity



A survey of 155 primary and high schools found that at least 55% of the surveyed schools are connected. A majority of schools that are not connected (40%) perceive the lack of infrastructure (55%), and high costs of equipment and service (21%, respectively) a huge barrier to connectivity. Whereas those that have disconnected (5%), state that the lack of resources to maintain connection is the major reason for disconnection.



From the connected schools, 71% experience challenges with their connection. These are mostly related to speed (58%), weather disruptions (25%), location (13%) and infrastructure (3%). However, an equal number of schools (47%) outsource ICT support services or use ICT teachers. This demonstrates the capacity for schools to maintain and sustain their connections. Therefore, even

though all schools have pointed out that ICT is an important factor to improve efficiency and administration, it is not clear how schools that are connected have used connectivity to that end. Nevertheless, the need for computer laboratories and computers is a gap to ICT as a subject itself.

5.7.2.3 ICT Needs

According to the Education and Training Sector Policy (2018): “The primary mandate of the Ministry of Education and Training is to provide access to relevant quality education at all levels of the education system to all learners in Eswatini; taking into account all issues of efficacy, equity and special needs”. Therefore, ICT is important in mainstreaming children with disabilities and special needs into the education system. This pushes forward the goal of inclusive, accessible and equitable education for all; which focuses on removing barriers to access education and ensuring inclusive education and life-long learning.

Hence, the Ministry aims to expand the scope of assistive technologies beyond learners with visual and hearing impairment, to those with invisible disabilities such as autism. “ We want to mainstream inclusive education through curriculum, targeting school for the deaf primary(140) and high school (100) learners, presently” interviewee, MoET. This will focus on equipping the National Curriculum Centre to generate learning content in audio, braille, Swazi sign language. More students (more than 30) still need individual assistive technologies yet, the capital budget to provide assistive technologies is usually 4 million a year which the government does not afford.

Representatives from the MoET expressed a dire need to increase internet coverage, radio and TV broadcasting, and lowering the cost of communication to ensure all learners are afforded the opportunity to learn online and have free access learning material and content, at an affordable and equitable rate (e.g. on YouTube, radio, TV, etc.).

5.7.3 Fund Role in Supporting e-Government

The strategic targets of the e-Government strategy are multi-sectoral and consistent with the Universal Access and Service potential targets and ESCCOM strategic targets. In interviews with stakeholders however it became clear that there is a gap: everyone knows that ICTs are essential for any form of e-Government plan to come to fruition, but the development of the ICT sector seems to be an afterthought indirectly connected to the e-Government strategy.

The e-Government effort is to be lead from the office of the Prime Minister, Operational Framework – e-Government Strategy for Eswatini (2015-2019). ESCCOM is a potential crucial strategic partner in this initiative as an alliance of co-operation for mutual benefit.

5.7.4 Fund Role in Supporting National Objectives - Summary

Overall there was a clear understanding of the Fund and prior knowledge of it amongst respondents. Certain public institutions such as the Ministry of Health, Education and Training, Tinkhundla and Administration and the Prime Minister’s Office have had on going engagements with the UASF and the Commission throughout the life of the first Strategy. In addition to the health and education connectivity projects highlighted above, stakeholders expressed knowledge of some of the Projects

that have been implemented under the Universal Access and Service Fund. The following projects were reported by stakeholders during the interviews:

- Network support for the Ministry of Health - installation of a microwave network to support the Client Management Information System. This focused on connecting well over 20 clinics that were either not connected or experiencing network problems.
- The Ministry of Education and Training also benefitted from the USAF. The activities were ICT as a subject (21 trolleys and 945 laptops) and support to learners with special needs (some devices and equipment for learners with special needs).
- Support to the Ministry of Agriculture - through government computer services microwave internet was installed at Ngculwini, Malindza, Mpisi farm, and Lomahasha. The challenge encountered during implementation was the inability to install equipment because of safety/security issues in the sites where the veterinary offices were located.
- Installation of base stations to improve wide area network and local area network in rural areas. This according to the Ministry of Tinkhundla and Administration improved network coverage in different constituencies.
- The project has also connected some of the country's border post, but more needs to be done to ensure that people are aware of the facility and use it.

The public sector stakeholders raised concerns about silo strategies and implementation which could lead to duplication of efforts and wasteful expenditure. To curb this, the stakeholders suggested on going stakeholder engagements and perhaps the establishment of an ad-hoc working committee that would ensure that all institutions are aware of the various interventions ongoing.

The private entities raised concerns about the slow and low rate in investment in the sector, specifically making mention of capex to rollout infrastructure and maintain it. This, they believe, perpetuates the access gap and drives up costs of communications. This is exacerbated in rural areas by the lack of basic infrastructure such as roads and electricity; it remains that over and above the lack of capex civil infrastructure is a challenge.

The lack of resources and research in the sector, in particular sector statistics means that investors are not able to conduct sound due diligence to inform investment. The limited data available from end users around the services rendered limits the Operators in product development and promotional products. Lastly, in the effort to promote digitisation and the development of a knowledge economy; the Operators have identified a lack of convergence in critical sectors such as financial services, agriculture, health, logistics and education. A convergence of these sectors can stimulate the investment needs as well as make a case for research and knowledge development.

5.8 Insights and Learnings

The key findings from the stakeholder engagements signalled that the strategy has made some impact in the ICT landscape of Eswatini since its inception; but further work still needs to be done. This is aligned with where the strategy finds itself, as the second strategy of the USAF more and more of the targets are towards long term sustainable measures that are addressing issues around digitisation, affordability and availability.

Rural connectivity remains a strategic point of intervention, as stakeholders believe that an increase in affordable and stable rural connectivity would increase uptake in services and eventually lead to economic efficiency and sustainability. Public sector projects and strategic plans will go a long way in supporting rural usage and uptake; however, the infrastructure investment is needed first.

As public sector embraces the fourth industrial revolution the inputs from the stakeholders have also taken shape to the ICT revolution; more public entities spoke of innovative means of usage and integration into everyday life. The use of Artificial intelligence, robotics and big data; shows that the Eswatini public entities are ready to utilise the capacity at hand for socio-economic development.

Stakeholders highlighted the complementary mandates of the various public institutions and departments, with the Commission and the UASF. This means that in order for effective implementation of any universal service strategy, the UASF and the Commission need to consistently promote transparency and accountability of the Fund to all stakeholders. Furthermore, to promote collaboration of efforts, the UASF should have continuous stakeholder engagements to avoid duplication of efforts and encourage strategic coordination.

KEY STAKEHOLDER FINDINGS AND RECOMMENDATIONS

- A. Transparency and Accountability** - ESCCOM needs to improve methods and channels for sharing information on how the Fund is managed, who qualifies to access the Fund, and what is the process for accessing the Fund. Stakeholders emphasised that the USAF should expand to assist the Ministry of ICT to push legislation to enable the fund to work well. This includes ensuring all legislative frameworks that inhibit the growth and deployment of ICTs in the country are fast-tracked, such as unbundling EPTC, approval of the broadcasting Bill.
- B. Continuous stakeholder engagement** is very important so that whatever assistance is provided is relevant to the beneficiaries. Stakeholders emphasised that institutions in the value chain of the Fund should be engaged throughout the implementation of the strategy to be able to position themselves and streamline projects with the fund.
- C.** The Fund should focus on **availability, accessibility, and affordability** of ICT to especially the rural population to ensure end users have access to services that will be implemented by government at constituency level. The fund should ensure communication backbone infrastructure reaches everyone.
- D. Strategic Coordination** of ICT activities at the Ministry level. The Ministry of ICT's Strategic Plan should identify all complimentary activities between parastatals and foster collaborative arrangements at that level which will be more effective and complementary. This will ensure that infrastructure investments are streamlined, there is no duplication of efforts and quality infrastructure investments are undertaken.
- E.** Prioritise investment in **infrastructure that affects ICT** such as roads and electricity), which makes some areas inaccessible and investments too high.
- F. Promote synergies**, collaboration, compatibility/complementarity, co-operation between service providers through fund activities to increase the adoption of ICTs and digitization of services.
- G.** Support **end-user technologies** to increase access, especially for selected groups of society.

- H. **Review tower sharing costs** and inclusion of government in agreement, to ensure that government continues to provide a public good on already existing infrastructure from service providers.
- I. The fund should focus on **investing in projects that have a clear lifespan**, outcome and strategic objective for instance, supporting ongoing systems where partner organisations have a vested interest and objective. This will ensure sustainability of investment and continuity of projects.
- J. Increase **support for ICT in education** to further support students with special needs and streamline disability in the education system

All stakeholders emphasised that access to the Fund would help them understand the capacity of the fund to implement certain projects, what is the fund funding that they can apply for or request funding for.

Figure 13: Key Stakeholder Findings and Recommendations

Impact of COVID-19

Like all other countries, Eswatini has been devastated by the COVID-19 pandemic especially the health and education sectors. At the onset of the pandemic, in the first half of the year saw significant slowdown in economic activity and trade due to a disruption in supply value chains. The tourism industry took a big hit due to shutdown of borders and due to almost zero activity within the hospitality industries. The trade balance dipped in the period, recording a trade deficit, owing to restrained activity for key export-oriented industries such as manufacturing of “miscellaneous edibles” and ‘textile’. Imports on the other hand, also indicated subdued performance in particular capital goods linked to slowing activity in production firms and construction-related sectors. However, pharmaceutical imports were up by 47%, reflecting the increased demand for personal protective equipment’s (PPE’s) in the fight against the COVID-19 pandemic. The SACU region remained the major source for the country’s imports as about 69 % of the total imports were sourced from the region, particularly in South Africa. Also, the continued depreciation of the Lilangeni against major trading currencies cushioned export revenues during the period. Government fiscal’s position resulted in weakened revenue generation owing to slowing economic activity. In terms of growth, still in the second quarter of 2020, the economy shrunk by 8,2% with the biggest decline experienced by the manufacturing sector (-6,3%). On the other hand, in the same period, the ICT sector grew by 3,9% outpacing growth experienced by health (0,1%) and the growing of crops within the agriculture sector (0,5%). Overall, the economy was initially expected to shrink by 6,7%. The Central Bank of Eswatini (CBE) maintained an accommodative monetary policy stance, with the discount rate slashed by 275 basis points from 6.75 percent in 2019 Q2 to 4.00 percent 2020

Q2. This was done in consideration of global, regional and domestic developments which prompted a quick response from Central Banks to stimulate economic activity by reducing interest rates, thus increasing liquidity in the economy.

To respond to the anticipated impact of COVID-19, the Government of Eswatini implemented partial lockdown to allow economic activities to increase without an equally associated increase in people's movements. Economic activity rebounded in 2020 Q3, coinciding with the easing of lockdown restrictions related to COVID-19 pandemic. The government also encouraged an increase the manufacturing of goods and developed an Economic Recovery Plan, which was eventually launched in August 2020. While the health sector continued to experience the worst impact of COVID-19 the other key sectors such as manufacturing, agriculture, ICT, and the financial sector showed great signs of improvement. For example, the ICT sector continues to see increased uptake by the public and the corporate world and the mobile operators have introduced new products (home data packages) to enable people to work from home. The agriculture sector improved by increasing local production of food and supplying inputs to the manufacturing sector. By the end of the fourth quarter, February 2021, new GDP estimates indicate that the economy will not shrink by the 6.7% but only by 2,4% overall. For 2021 the economy has been forecasted to record a positive growth rate of 2.7%.

Overall, the pandemic has been a wakeup call for the Government of Eswatini to implement key structural reforms to improve the viability and sustainability of the Eswatini economy. There is more drive to implement policy changes that can improve productivity and the overall ease of doing business in order to increase GDP. Some of these key policy changes includes the ICT sector which has key reforms targeting the Eswatini TV, EPTC, and RSTP.

6. FUNDING AND BUDGET ASSESSMENT

6.1 Overview

The Fund is a subsidiary of ESCCOM as per the legislative prescript and as such has received assistance from the Commission's finance department in preparation its financials over the period. This financial assessment is informed by interviews with the finance department, and a review of the findings of the Audited Financial Statements (AFS) for the past three financial years. The AFS were independently prepared in line with best practice.

The following are the sources of funds permissible in terms of the law-

- a) Every provider of public electronic communication service shall contribute 0,5% of their yearly net operating income,
- b) Every provider of Postal service shall contribute 0,5% of their yearly net income,
- c) Every provider of Broadcasting service shall contribute 0,5% of their yearly net income,
- d) Any funds or revenue of ESCCOM remaining unused at the end of the financial year is remitted into the Fund,
- e) Grants and donor agencies may make contributions,
- f) Interest earned on the Fund's investments

In practice however, the framework for payment of UASF has not been established for both the Postal and Broadcasting services providers, therefore, the Fund's main sources of income are the Commission's contribution and the public electronic communication service providers' contributions – i.e. operators providing ISP, mobile and fixed services.

At the outset of the implementation of the strategy, the Fund already had collected E 29 970 751 reserve funds, as per the 2018/19 audited financials, these funds had accumulated over the years prior to the Funds' inception. These Funds were collected from contributing licensees, such as MTN, who contributed even though the framework had not yet been finalised, and from the Commission.

Given the fact that the Fund already had reserves when the strategy was approved, in its first year of operations under the strategy, the Fund was able to spend E19.1 million in the financial year 2018/2019 and E30,4 million on its programmes in the 2019/2020 financial year. This is despite the low level of collections of approximately E740,936 in 2018/19 which was significantly below the amount that was invoiced and due. This situation created a gap in funding, although it had no concomitant cashflow impact. The lack of alignment between cashflow and collections is a recurring theme throughout this analysis.

Over the period of the strategy approximately E41 million has been collected to date. This is split as follows:

- In the 2018/2019 financial year the Fund received E 740 936, which was short 89% of what the Fund had invoiced.
- Subsequently, in the 2019/2020 financial year the Fund received contributions of E14 million which were a settlement of the 2018/2019 financial years outstanding levy contributions. This

includes a contribution to the Fund from the Commission of E7 751 748 which is not a levy but a surplus contribution from the Commission. Therefore, the balance of E 6 282 304 collected in this period is from the previous financial years outstanding levy.

- Therefore, no levies have been collected for the 2019/2020 financial year in settlement of the levies due to the Fund on this financial year.
- In addition, the Commission committed a once-off E20m contribution in 2019/2020, which increased the total amount due in that year. This amount was however not paid to the Fund until it was settled in 2020/2021
- In 2020/2021, the Fund is project income of E27 609 501 including the outstanding E20 million from ESCCOM from the financial year 2019/2020. The difference of E7 609 501 due this year is the outstanding levy from the financial year 2019/2020 which is yet to be paid over to the Fund by Operators.

Based on the available financial records, a key finding is that every year there is a gap between what is invoiced and what is collected – therefore the Fund is under collecting; phrased differently the industry is underpaying – even vis a vis the relatively low fee of 0.05% of net operating income. Given this finding, there is a need to strengthen collections from licensees – this will facilitate constituency, accountability and transparency.

A further finding is that the Fund is highly reliant on subsidisation from the Commission. Approximately 55 percent of the 2019/20 contributions received were sourced from the Commission. This increased to over 74 percent in the 2020/21 financial year. Rather than increase the Commission's contribution to make up for the shortfall experienced in prior years, consideration should be given to (1) increasing the levy paid by operators, and (2) strengthening the Commissions ability to collect from these sources.

The current approach of closing the gap with funds from the Commission is risky considering that the Commission is not obligated to make financial contributions towards the Fund, it is imperative that the dependence on the Commission should be lessened and shifted towards the wider industry. Furthermore, the contributions are at the discretion of the Commission, which is informed by the remaining unused revenue of the particular financial year, which means that the Fund cannot predetermine the Commission's contribution and budget accordingly.

Excluding the Commission, Eswatini MTN is the largest contributor (17.8%), followed by EPTC (5.5%) and Eswatini Mobile (0.09%) based on the amounts that have been invoiced. Given that the contribution is based on net operating income and each operators relative size in the market, the variance in contributions can be expected.

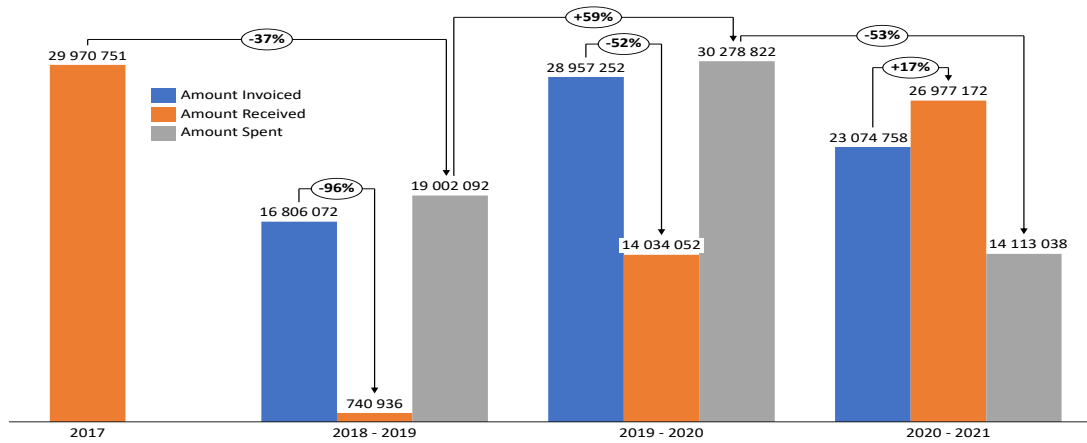


Figure 14: Revenue Analysis of the UASF

Contributions towards the USOF

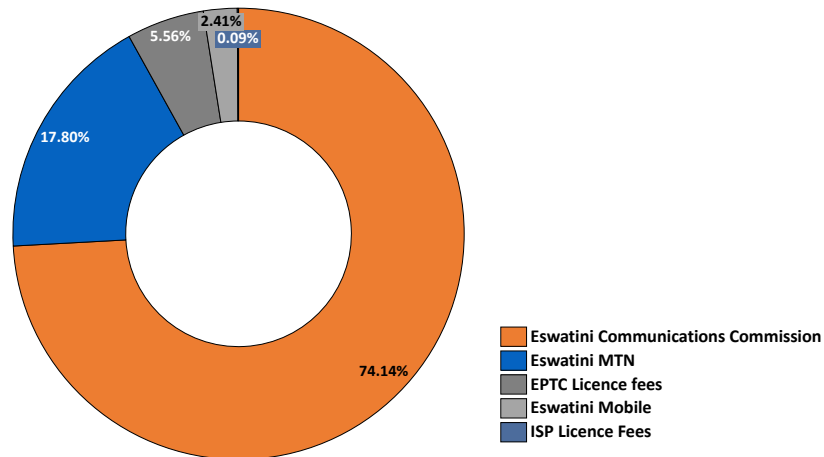


Figure 15: Contributions towards the USOF

6.2 Expenditure

The Fund has demonstrated its capacity to effectively spend the money collected, which is a positive attribute. Many Funds in developing countries over-collect and underspend – the situation in Eswatini is the opposite. Having spent about E19 million in 2018/19 and E 30 million the following year, the Fund has demonstrated that it is able to ramp up and design, develop and implement projects. The 2020/21 projected spend of E14 million is lower than previous years, however it should be noted that given the COVID-19 pandemic and the associated national lockdowns, it was not ‘business as usual’ and the normal project cycle and spend may have been interrupted.

In light of the finding that the Fund in Eswatini has demonstrated an ability to spend the funds collected, and that the Commission has had to make up for under collections each year, there is a need to regularise the amount collected and the collection mechanisms. It is therefore proposed that

the Fund is in a position to recommend an increased levy to the Commission. The Commission should undergo the necessary processes to increase the level from the current level of 0.5% which is a regional low, to a regional mean of 1%. Considering SADC countries with smaller populations in SADC, the levies in Botswana and Lesotho are 1% of operating income, and in Namibia it is 0,5%. Some other African examples are provided below, with greater detail provided in the benchmarking section of this report.

Country	Levy
Botswana	1% of Net operating Revenue
Lesotho	1% of Net Operating Revenue
Namibia	0.5% or 0.02% whichever is lowest

Figure 16: Levies in SADC countries with smaller populations

The proposed increase will address the current under-collection, the market situation and the pipeline of projects. As the current process of the development of the new strategy is finalised, it may be deemed necessary to increase the levy further to meet the needs of funding a robust strategy that will close the broadband divide in Eswatini.

In addition to a proposed increase in operator’s contribution, the Fund should seek to widen the sources of contribution to lessen the burden on the currently contributing operators while securing its sustainability. To that end:

- It is noted that the law allows donors to make grants and contributions to the Fund – given the synergies with other projects on the ground, the Fund should consider partnering with NGOs and other agencies to increase the money available in the fund and its ability to develop and drive sustainable projects.
- As mentioned earlier, broadcasting and postal services licensees should begin to contribute to the fund. The design of projects that need those sub-sectors needs is a key part of the next strategy and it is therefore important that the funding reflects this.

6.3 Key Findings and Insights

At present, the Fund is consistently faced with a “financial gap” resulting from cashflow constraints, and the under collection which leads to reduced revenue. A reasonable increase of the operators’ contribution, from 0,5% to 1% of their yearly net income would bolster the Fund’s financial muscle. In addition, increasing the sources of funding and introducing more effective collection mechanisms will increase the effectiveness of the Fund.

The Commission has undertaken an initiative to implement sector reforms that will promote fair competition, encourage higher participation and open the sector to new entrants. While this may not take effect in the short-term, the Fund will continue to work jointly with the Commission to make sure that the removal of hurdles to market efficiency is not realised at the erosion of the operators’ revenue.

7. UNIVERSAL ACCESS TO BROADBAND

7.1 Why is broadband development so important for Eswatini

Broadband access presents an opportunity for a digital future for Eswatini in that it will assist to stimulate the productive sectors of the economy and government initiatives such as the e-government strategy. In addition, it will have a positive impact on job creation. Universal access to broadband must be a strategic tool for ESCCOM and therefore, for the Government of Eswatini. This section looks at the two key impacts of broadband, i.e. its impact on socio-economic development and its impact on job creation.

7.2 Terminology

It is important to clearly define the distinctions between the terms ‘Internet’ and ‘broadband’, since broadband is also Internet. In this report the term ‘Internet’ refers to connectivity that is not broadband. The International Telecommunications Union (“the ITU”) benchmark states that broadband should be access at speeds above 1.5 Mbps. The Commission recognises Broadband to be speeds of 4Mbps and above, as such this is the definition that will be adopted by this report.

7.3 ICT Impact on Socio-economic development

Infrastructure development is a significant contributor to economic development. Investments in infrastructure are key to achieving sustainable development and empowering communities. It has long been recognized that growth in productivity and incomes, and improvements in health and education outcomes, which are pillars of the Eswatini e-government strategy, require investment in infrastructure – hence the critical role of ICT infrastructure in broader national development. Inclusive and sustainable industrial development is the primary source of income generation, it allows for rapid and sustained increases in living standards for all people, and provides the technological solutions to environmentally sound industrialization, including the Fourth Industrial Revolution driven by the ICT sector.

In recognition of the important role of infrastructure on sustainable socio-economic development, Goal 9 of the United Nations Sustainability Development Goals provides that, countries should, amongst others:

- Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all
- Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry’s share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries
- Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020

Broadband infrastructure and services are critical and the role of broadband role is central to development, so much so, that governments around the world are encouraging broadband deployment and use as part of their national economic and social development strategies. Broadband is the underlying infrastructure not only for major improvements in productivity, but also to connect small and medium-sized businesses with their customers; farmers to their markets; students to quality education; remote communities to modern healthcare; and villages to each other to address a vast array of interests⁸.

A frequently cited World Bank study found that low-income and middle-income countries experienced “about a 1.38 percentage point increase in GDP for each 10 percent increase in broadband penetration” between 2000 and 2006.⁹ Furthermore, it has been argued that the doubling of mobile data use caused by the increase in 3G connections boosts GDP per capita growth rate by 0.5% globally. The Internet accounts for 3.4% of overall GDP in some economies. In developed countries and countries with ubiquitous broadband, most of this effect is driven by e-commerce, by advertising and selling goods online.¹⁰

The figure below shows the total (real) investment per operator on their network infrastructure.

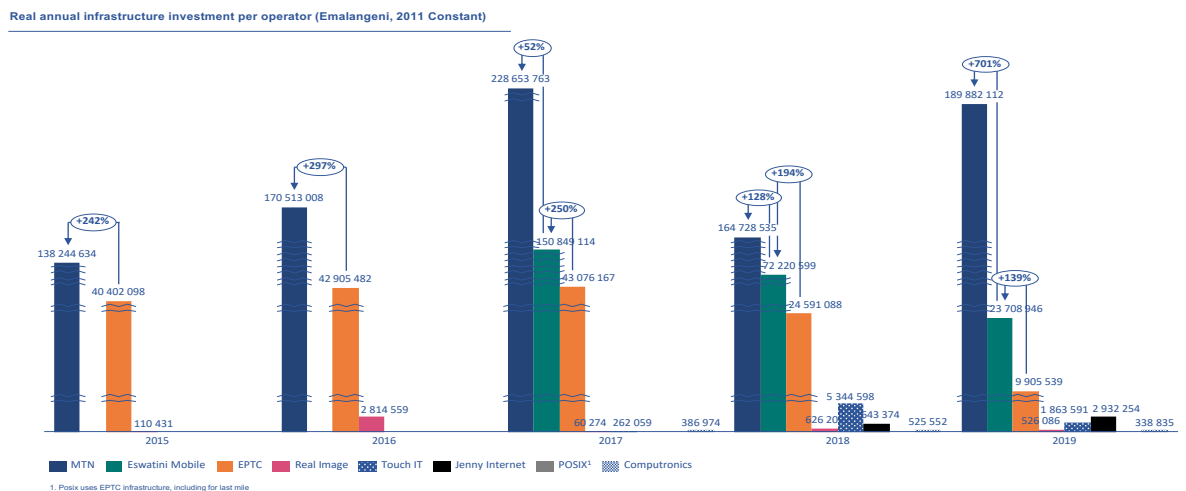


Figure 17: Annual investment per operator, 2016-2019

MTN invested the most in its infrastructure throughout the period, up to 701% more than the second-largest investor in infrastructure, ESM. 2017 was the greatest investment year for EPTC (E 49,3 Million), ESM (E 150,8 Million) and MTN (E 261,8 Million), while Real Image invested the most in 2016 (E 3,2 Million), Touch IT invested the most in 2018 (E 6 Million) and Jenny Internet invested the most in 2019 (E 3,3 Million).

⁸ http://www.cisco.com/web/about/ac79/docs/Broadband_WP_0831REV_FINAL.pdf

⁹ <http://broadbandtoolkit.org/Custom/Core/Documents/Broadband%20Strategies%20Handbook.pdf>, Source: Qiang and Rossotto 2009, 45; see also Kim, Kelly, and Raja 2010

¹⁰ Kvochko, Elena, World Economic Forum. 2013. Five ways technology can help the economy, <https://www.weforum.org/agenda/2013/04/five-ways-technology-can-help-the-economy/>

Investment in mobile network infrastructure expansion averaged 0.7% as proportion of GDP between 2017 to 2019. In 2016 (baseline) the total number of mobile networks BTS sites amounted to 721, at the end of December 2019 there were 1, 310 mobile network BTS sites in the country as seen in Figure 18.

Network expansion was mainly on mobile broadband network coverage namely 3G and 4G/LTE technology from 399 BTS sites in 2016 to 793 BTS in 2019.

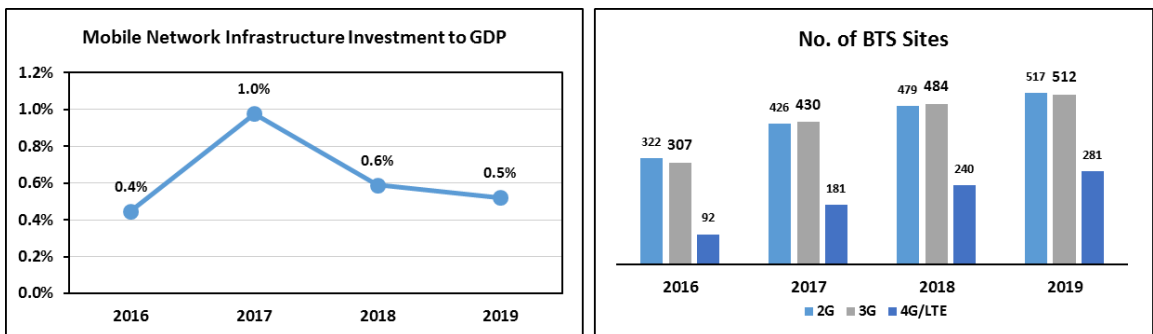


Figure 18: Mobile Network Infrastructure Investment.
Source: ESCCOM

Fixed network expansion has been on a downward trajectory from Investment to GDP ratio of 0.1% in December 2016 (baseline) to 0.04% in December 2019 as observed in Figure 25 below.

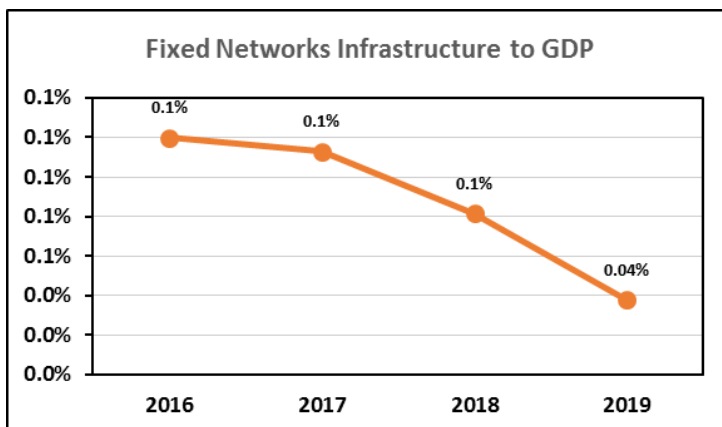


Figure 21: Fixed Network Infrastructure Investment.
Source: ESCCOM

7.4 ICT sector contribution to GDP in Eswatini

The influence of the ICT sector in Eswatini’s economy as an enabler of economic activity and growth can be observed in real GDP and ICT sector growth trends between 2001 to 2019, the similar growth trends could be attributed to the influence of the ICT sector across all industries and consequently on overall economic activity in Eswatini.

ICT Sector economic activity in Eswatini contributes 2 percent to overall GDP, in 2019 this contribution amounted to E1.29 billion at constant 2011 prices. ICT sector activity comprises mainly of Telecommunications and Information Technology (IT), Broadcasting and Publishing services. Telecommunications is the main driver of the ICT sector in Eswatini contributing over 90% to ICT sector GDP, which in 2019 was equivalent to E1.9 billion at constant 2011 prices.

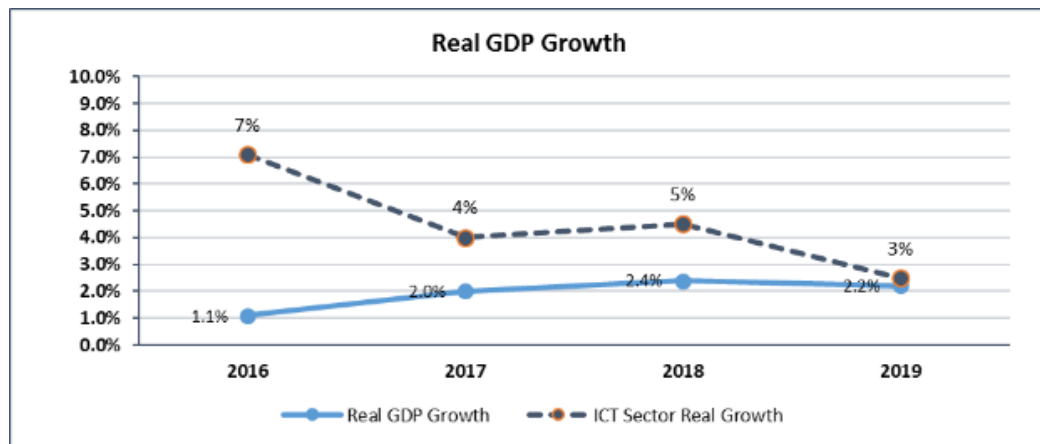


Figure 22: ICT Sector Real GDP Growth

Source: ESCCOM

While ICT Sector GDP growth slowed down from 7% in 2016 (baseline) to 3% in 2019, overall real GDP recorded an increase from 1.1% in 2016 (baseline) to 2.2% in 2019, see Figure 27 below.

Historically the ICT Sector’s growth trajectory was volatile between 2001 and 2013 as observed in Figure 28 below, on average growing by 0.3% per annum. ICT sector growth recovered from a 12% decline in 2013 to record 13% growth in 2014. It continued to record positive growth thereafter, however, on a downward trajectory reaching 7% in 2016.

ICT sector growth continued to slow down from 7% in 2016 to 4% in 2017 and recorded a slightly higher growth in 2018 of 4.5% before falling to 2.5 percent growth in 2019. In Emalangeni value ICT sector GDP increased from E1.16 billion in 2016 to E1.29 billion in 2019 at 2011 constant prices.

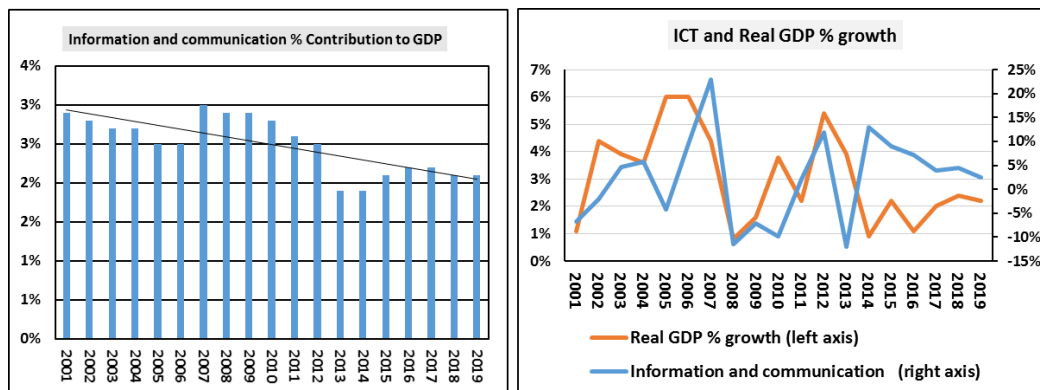


Figure 23: ICT sector contribution to GDP, 2001 - 2019.
Source: CSO National Accounts, 2019

8. UNIVERSAL ACCESS GAP ANALYSIS

The access gap refers to that section of the population that will never be reached by operators through regulatory interventions due to the high cost of roll-out to these areas or low-income levels of the population. The Universal Access and Service Fund (UAS Fund) will be critical in extending service to these geographic areas and sectors of the population. Analysis of the geographic access gap (supply side) and the user access gap (demand side) lead to the same conclusion on possible UAS regulatory approaches with respect to the four regions.

8.1 Regulatory Gap Analysis

Universal Service and Access Strategies and strategies for the implementation of the Fund seek to assist a country to meet its socio-economic targets through the use of ICTs. A key foundational element of any strategy is therefore the policy framework and the legal and policy commitments entered into both nationally and regionally.

The Eswatini universal service and access framework is well developed and is framed based on the policy documents set out in section 3 of this Appraisal Report and summarized in the diagram below:

- National Information and Communications Infrastructure (NICI) Policy, 2006;
- Eswatini ICT Policy, 2007;
- Science, Innovation and Technology (SIT) Policy, finalised in 2012; and
- e-Government Strategy for Eswatini, 2013 to 2017

Recently, the Kingdom of Eswatini Strategic Road Map (2019 – 2022) and the Post Covid-19 Economic Recovery Plan have been added which also align with National Growth Plans and Objectives. In addition, international and regional targets are referenced including the Sustainable Development Goals and the SADC 2025 Targets.

At a legal level, the ECA and the 2016 Universal Access and Service Regulations are key in informing the approach taken by the Fund. The recommendations in this section take into account these key strategic, policy and regulatory documents, and specifically highlight gaps that have been identified, namely:

- general challenge in Eswatini of amending regulations to keep up with innovation and market and technological developments
- stipulation of what can be funded and therefore form the basis of projects, in particular given convergence and the inclusion of broadcasting and postal in the universal access and service framework and as contributors to the Fund
- identification of who can be funded and therefore receive funding, in particular given strides made in closing the gap in schools and health facilities
- identification of targets and standards, in order to have measurable objectives
- ability to measure achievement of standards and targets (overlapping legal, stakeholder and market research intervention)

8.1.1 General challenges

In most jurisdictions the regulation making process is run completely by the regulator, in some cases with a requirement to seek approval from the Ministry. The Minister is in almost all cases responsible for policy making and for making proposals on legislation which is then passed by Parliament. The policy and law necessarily inform the content and direction of regulations – thus providing checks and balances for the regulator. Regulations are then drafted and consulted upon by the regulator and then promulgated by said regulator (or sometimes Minister).

In Eswatini the regulation making process and the legislation. Making process are similar in that they both require Parliamentary approval, thus making the process of regulation making more complex and lengthier. This therefore requires that the regulations be robust and able to stand the test of time, especially in the fast-moving ICT sector. Thus, while in other countries regulations are amended fairly regularly and with relative ease, this is not the case in Eswatini. Given this context, the regulations which were in line with 2016 best practice, are in some ways outdated for the current 2021 context as set out in the remainder of this section.

A broad recommendation for ESCCOM (beyond the scope of this report) is to review the regulation-making process, as this finding cuts across the entire regulatory framework.

8.1.2 What can be funded?

The Universal Service and Access Regulations (2016) provide that universal service obligations (USOs) and funding developed by the Commission may apply to any or all of the following categories of ICT service and infrastructure:

- Voice communications services,
- Data communications services,
- Infrastructure for the provision of voice or data communications services,
- Equipment and end user devices; and
- Training and skills development.

In addition, the newly passed broadcasting and postal legislation seeks to align these sub-sectors with these regulations. However, for consistency in application and to avoid disputes with respect to the collection and disbursement of funds in future, it is recommended that these regulations be aligned with the new legislation and represent a truly converged approach. This would require:

- the addition of broadcasting service and postal service to the regulations, or alternatively, and preferably, a service neutral approach to the regulations that does not distinguish between voice (which is less of a commodity today than it was in 2016 when the regulations were made) and data and refer to “broadband.”
- The maintenance of a focus on infrastructure, but no specification of what it should be used for (in future it may be used for Internet of Things, fintech, or any other uses underpinned by ICT)

8.1.3 Who can be funded?

Furthermore, in terms of the 2016 regulations persons eligible to receive subsidies from the Universal Service Fund, subject to Fund projects and priorities as determined by the Commission, may include:

- Persons with disabilities,
- The elderly / recipients of social grants; and
- Schools, higher education institutions, state hospitals and state health facilities.

Priority sectors in Eswatini for ICT connectivity can thus be understood to be education and health, in line with the e-Government Strategy, as well as rural and underserved areas. This is still consistent with the national landscape and objectives, however, over time as projects are rolled out and gaps are closed, priorities may shift – there needs to be room to change the priorities sectors from time to time.

8.1.4 Targets and Standards

Furthermore, both voice and data (broadband) are considered important for growth and development. However, the regulations do not go as far as determining universal service targets for these services, these can be set in the policy documents that need to be put in place. Therefore:

- Eswatini must consider defining the broadband regulatory framework better, taking into account the broadband ecosystem approach. This includes setting minimum standards and medium- and long-term targets.
- Consideration should be given to preparing a Digital Transformation Policy for Eswatini. This would go beyond the proposed Broadband Policy and would combine the elements addressed in the old NICI Policy and the ICT Policy, with what is generally present in a Broadband Policy to focus on broadband, universal service, and converged infrastructures for the telecommunications, broadcast and postal sectors, as well as digital services in the telecommunications, broadcast and postal sectors, and will go further and include e-commerce, e-government, fintech, digitisation, IOT, Artificial Intelligence and other elements of future industrial revolutions. Such a new policy dispensation would provide a sound basis for more advanced sector regulation.

Once this has been done, the rollout obligations and targets set out in the UAS regulations need to be revised and aligned with global and regional targets, as well as developed in a manner that meets EmaSwati national objectives. The specific targets that require revision are those that are linked with Section 21(1) of the UAS regulations read with the Schedule.

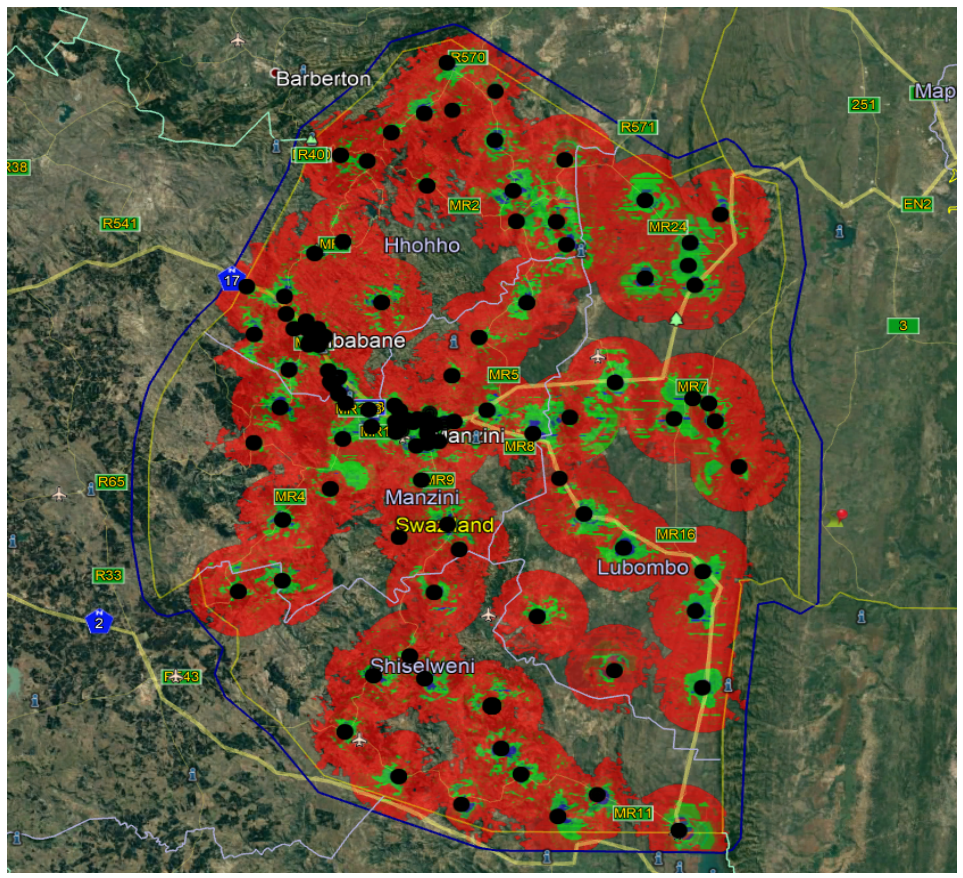
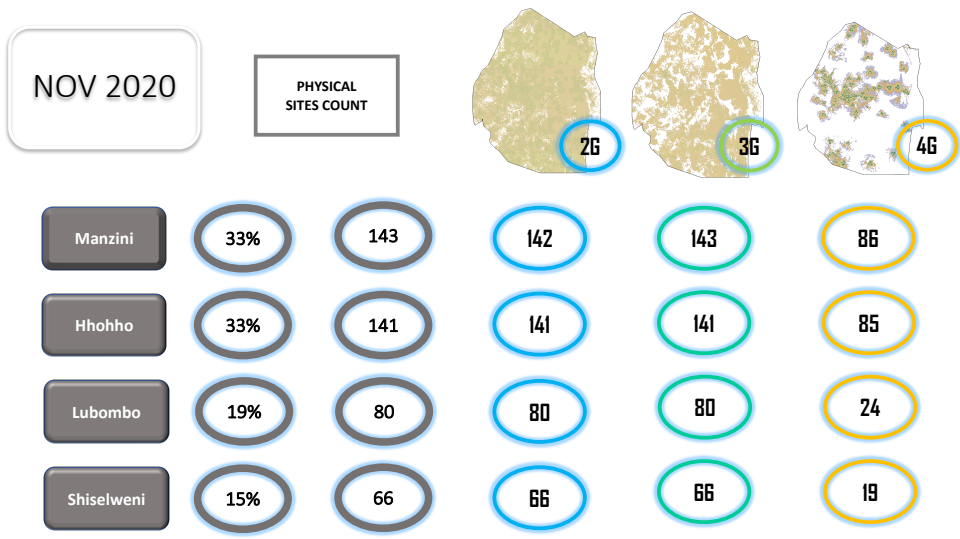
8.1.5 Need for baseline data to enable Eswatini to report against International, regional and national targets

Alignment with all of these policies is key and in terms of the analysis the following gap has been identified, in specific where high level targets already exist (primarily at regional and international level):

- Absence of baseline data for the targets poses a challenge in terms of measuring progress between now and the key target dates. This challenge is underpinned by a broader concern related to the availability of up-to-date market information. It is recommended that ESCCOM and the Fund work with the Central Statistics Office (CSO) to prepare questionnaires and questions specific to the ICT industry to be included in the national census, in household surveys and in other statistical studies for Eswatini. It is also very important that this data be segregated to the Tinkhundla level, in order to provide a more specific geographic analysis in the future. Obtaining data at the Inkhundla level will enable ESCCOM to better target and recommend areas of priority for UAS projects, and for the deployment of infrastructure. For example, regulatory incentives can be introduced in areas with very low penetration, if data indicates that such incentives will impact on reach and access.

8.2 Geographic Access Gap (Supply Side)

Based on the coverage maps and forecast data for infrastructure roll out, all the Operators have adopted a commercial strategy that prioritise development and infrastructure deployment first in Manzini, followed by Hhohho, Lubombo and Shiselweni. Manzini and Hhohho are priorities with Lubombo and Shiselweni being secondary areas of focus. Hence, Manzini and Hhohho, have higher infrastructure deployment than the remaining two regions. This data suggests that a UAS funding programme should focus primarily on the regions of Lubombo and Shiselweni to address the “access gap”, making Manzini and Hhohho areas of focus for regulatory mechanisms to address the “market gap”.



8.3 Population Access Gap (Demand Side)

The market still has significant potential from a household perspective. Manzini has the largest number of households: 19% larger than Hhohho, 70% larger than Lubombo and almost double, 95%, that of Shiselweni. In terms of population size, Manzini surpasses the four regions by 13%, 54% and 53% respectively. Logic implies that UAS regulation could therefore encourage industry to address the “market gap” (mainly observed in Hhohho and Manzini), while other UAS mechanisms, such as the UAS Fund, are applied to Lubombo and Shiselweni, which experience an “access gap”.

Region	Population	2G Mobile						Internet						Mobile Internet					
		Unserved Population	Current Access	Additional Addressable Pop*	Market Gap	True Access Gap	Capital Cost	Unserved Pop	Current Access	Additional Addressable Pop	Market Gap	Access Gap	Capital Cost	Unserved Pop	Current Access	Additional Addressable Pop	Market Gap	Access Gap	Capital Cost
National	1 170 000	40 000	97,3%	4 883	0,0%	2,3%	TBC	629 900	47,0%	333 847	28,0%	25%	TBC	645 563	44,8%	342 148	29,2%	26,0%	TBC
Hhohho	366 359	7 327	98,0%	2 575	98,7%	1,3%	TBC					TBC						TBC	
Lubombo	269 172	10 767	96,0%	-	96,0%	4,0%	TBC					TBC						TBC	
Manzini	414 038	4 031	99,0%	1 543	99,4%	0,6%	TBC					TBC						TBC	
Shiselweni	270 109	5 942	97,8%	765	98,1%	1,9%	TBC					TBC						TBC	

9. UAS FUND BENCHMARKING

9.1 Regional approaches – benchmarking Fund Management Approaches

Most countries in the region have a Fund established on similar premises as the UASF in Eswatini. In terms of institutional framework, within the SADC region, in similar sized countries the tendency is to have the Fund situated within the regulator, rather than stand alone as in the case in larger economies like Ghana, South Africa Nigeria. Levies range from 0.2% (South Africa) to 4% (Niger). More than half the funds studied by GSMA (12 out of 23) apply levies of 2% or more of operator revenues. Other than levies, sources of funds vary but tend to include:

- Monies provided by Parliament.
- Investment made by the Trustees of the Fund/ Board of the regulatory authority Donations, grants and gifts.

	BOTSWANA	LESOTHO	ZAMBIA
FUND LOGO AND WEBSITE	 http://www.uasf.org.bw/ 		
BUDGET	<p>Total levies from operators amounted to BWP 50,308,222 = E 69,042,929 (2020) The Regulator contributed BWP 21,285,027 = E 29,211,539 from its surplus revenue for the year under review. (2020)</p>	<p>Fund Contribution : M26m (2019)</p>	<p>Universal Access Contributions: K69m = E47m and K5.5m = E3.75m from Other Income (2019)</p>
STRATEGIC PERIOD	3 Years	3 Years	Not Specified
CONTRIBUTION	<ul style="list-style-type: none"> 1% of Gross Revenue Received from licensed Telecommunications Service Providers, Commercial Radio Broadcasters, Commercial Television Broadcasters, and the Public Postal Operator 	<ul style="list-style-type: none"> 1% of annual Net Operating Income, the Act provides for a levy of up to 2% of the licensed telecommunications operators' net operating income 	<ul style="list-style-type: none"> A rate not exceeding 1.5 percent of the licensed telecommunications operators' gross annual turnover
OTHER PERMITTED SOURCES OF CONTRIBUTION	<ul style="list-style-type: none"> Government contributions as may be appropriated by the National Assembly from the Budget; Grants and donations received for universal access and service projects; Any surplus income of the Authority; and Investment income from accumulated funds. 	<ul style="list-style-type: none"> The Government, pursuant to an appropriation made by the Parliament or in any other lawful manner; The revenue from the Authority composed of: a) An initial seed capital of M10 million b) An annual contribution of not less than 25 percent of its annual surplus Grants from donor agencies 	<ul style="list-style-type: none"> The Fund may receive moneys from appropriations from Parliament, grants, donations and other sources

Figure 24: Benchmark Overview - Botswana, Lesotho and Zambia

Sources: LCA: <https://www.lca.org.ls/?s=USF>,

ZICTA:

<https://www.zicta.zm/storage/posts/attachments/jzDdmDTQr5cWOnQgpx4LaZwaMVzQWYfdMmxO3lcp.pdf>

BOCRA: <http://www.uasf.org.bw/>

	BOTSWANA	LESOTHO	ZAMBIA
ADMINISTRATIVE SET-UP	<p>The fund is overseen by an independent UASF Board of Trustees, BOCRA serves as the Secretariat to the UASF</p>	<p>The USF shall be administered by the Executive Secretary. The functions of the ES are as follows: i.e Executes the decisions of the Committee; ii. Transacts the day-to-day business of the Fund; iii. Organizes and provides secretarial work to all meetings of the Committee; iv. Exercises such powers as directed by the Committee; and v. Performs the secretarial functions of the Fund.</p>	<p>Act No. 15 of 2009: administration and management of Fund: The Fund shall be managed and administered by a Fund Manager appointed by the Authority. The Fund Manager shall each year publish details of the activities of the Fund within three months of the end of the financial year of the Authority.</p>
PROGRAMMES	<ul style="list-style-type: none"> Public Wi-fi Hotspots Development of 3G and 4G Network coverage in rural villages Computerisation and internet connectivity to rural schools Closing of telecommunications network gaps along the Trans Kalahari highway 	<ul style="list-style-type: none"> Supporting Lesotho Internet Exchange Point Promoting digital literacy in schools Funding of Communications Infrastructure projects 	<ul style="list-style-type: none"> Rural connectivity , Road accessibility Renewable energy / solar projects Rural electrification, Payphone rollouts
LEGISLATION AND REGULATION	<ul style="list-style-type: none"> Communications Regulatory Authority Act No. 19 of 2012 (CRA Act): Section 5 (1) (b) of CRA gives BOCRA Board administrative responsibility to promote and ensure universal access Section 5 (1) (c), of CRA allows for the Board to impose a Universal Access and Service (UAS) levy on identified operators for purposes of funding universal access in the communications sector. 	<ul style="list-style-type: none"> The Fund operates under the Communications Policy 2008. The policy objectives for universal access to voice telephony, internet access, broadcasting and postal services are also well articulated in the Act. In addition to the 2008 policy, the Government has endorsed targets as part of the SADC and in for SDGs. Therefore, there is a need to assist the Government to meet these targets which are all meant to improve the quality of life for all citizens. 	<ul style="list-style-type: none"> The Telecommunications Act of 1994 addressed the concept of universal access to telecommunications services by mandating the Communications Authority to take all reasonable steps to extend the provision of telecommunications services throughout all rural and urban areas of Zambia, including emergency service, public call box services, and directory information services. no secondary legislation was enacted to support management and administration of the Fund.

9.2 European Approaches – benchmarking funding strategies, projects and approaches (no Funds per se)

This is not a ‘like for like’ benchmark given market sizes, terrains, and economic and market development; however the funding approaches and subsidisation model are instructive and provide lessons for ESCCOM. Most countries have broadband plans or programmes which include funding approaches for addressing rural and remote areas. The Broadband Plan or Strategy, or Digital Strategy sets the framework for the funding approach. The priority tends to be ensure the roll out of high speed networks in rural and remote areas through partnerships between government and the private sector using varying subsidization models.

The table below is outlines the **Potential Global Partners**. Local due diligence of potential partners will be conducted, however, some global partnership opportunities can be pursued.

BROADBAND FUNDING STRATEGIES, APPROACHES AND PROJECTS			
	FRANCE	FINLAND	UNITED KINGDOM
General approach to urban and medium density areas	Market driven approach to broadband roll out. Competition between operators who can invest at good returns on capital, facilitating good connectivity for consumers.	Market driven approach to broadband roll out. Competition between operators who can invest at good returns on capital, facilitating good connectivity for consumers.	Market driven approach to broadband roll out. Competition between operators who can invest at good returns on capital, facilitating good connectivity for consumers.
Rural Areas Approach	Launched in 2013, the Plan France Très Haut Débit (Broadband Programme) was set up by the state to support the funding of high-speed broadband connections in rural markets that would not be financially viable for commercial operators. The hybrid approach (private/public) is supported is overseen by ARCEP (regulator)	Broadband support schemes are available, such as the rural programme, which offers financial support for municipalities, cooperatives and SMEs in rural areas for the construction of broadband networks, with the support covering 50 - 70 per cent of the total costs.	Government supports investment in fast broadband provision to rural areas. Treasury pledged £5 billion in March 2020 Budget to fund "gigabit networks" in the 20% of the country most difficult to reach.
Specifics of Broadband Programme	<ul style="list-style-type: none"> PPP/concession structures applied to broadband projects in regions where (1) there is a sole operator and further network capacity is required, or (2) where there are no incumbent operators and no provision In these scenarios network operators and public authorities both contribute to the funding of new network infrastructure, with the local authorities drawing down finance from the Plan France Très Haut Débit. The first projects launched were awarded large public subsidies, but more recent projects were financed with very limited to no public subsidies. Upon completion, the private sector service provider is granted a concession to run the network for 25 to 30 years in return for contributing to the upfront investment in the network. This model has seen existing operators focus on their urban networks, and opened up space for new players with PPP portfolios to establish their franchises in rural and semi-rural parts of the country. 	<ul style="list-style-type: none"> The 2010 Broadband Programme scheme (the application period of which has expired but is expected to renew and continue in similar form as of 2021) Support is open to all applicants through public tenders and sees the government covering 33%, 44% or 58% of the eligible costs depending on the municipality's financial status, with the relevant municipality offering from 8 to 33 % and the private sector applicant putting up a minimum of 34%. In return for this state support, private partners have to commit to offering network and communications services for at least ten years and allow other operators to access the funded network on reasonable terms. Applicants are screened pre-project with respect to the scope and pricing of services they plan to offer, as well as their financial status and risk analysis of the operations and finances of the proposed project. 	<ul style="list-style-type: none"> Broadband funding is deployed via Building Digital UK (BDUK), a part of the Department for Digital, Culture, Media and Sport (DCMS). BDUK runs voucher schemes that contribute to the costs incurred by small businesses and communities when installing high-speed broadband in rural areas. Qualifying premises can receive vouchers of up to £3,500 for SMEs and £1,500 for residences. BDUK is also in the process of outlining a framework for investing directly to connect public sector sites in hard to reach areas to highspeed broadband. This connectivity can then be leveraged by commercial players to reach other properties nearby. BDUK is also looking at putting out contracts to tender to deploy fast broadband in areas where the market has not done so.

Figure 25: Potential Global Partners
Source: White & Case

ANNEXURE

Sponsor/ Potential Partner	Project Types	Gap being addressed	Focus Area
Google/ Alphabet	<p>Projects listed here are past projects to give an indication of project types – new projects can be applied for subject to discussions</p> <p>Loon: Using high-altitude, wind-propelled balloons to help mobile operators extend wireless networks without building cell towers or running fiber optic cable. Initial connections have been made, but more work is needed for scale.</p> <p>(Note: Project Loon seems to have closed in 2021, Project Taara, using beams of light to expand access, will replace it</p> <p>https://x.company/projects/taara/)</p> <p>Project Link:</p> <p>Building micro fiber networks to enable Internet service providers (ISPs) and MNOs to share infrastructure. Pilot built in Kampala, Uganda. Currently working in Accra, Ghana. No information on level of funding publicly available.</p>	Infrastructure; Low Incomes and Affordability	Developing and deploying technology solutions; Incubating and scaling innovative business models
<p>USAID</p> <p>Global Broadband and Innovations; Africa Broadband Partnership</p> <p>https://www.usaid.gov/southern-africa-regional/opportunities</p>	<p>Global Broadband and Innovations: Launched in 2010 (10 year programme which appears to have been extended in 2020), working with the public sector to release USFs and to establish National Broadband Plans and extend broadband into rural communities. Working with the private sector to increase rural broadband deployments and introduce cost-effective technology solutions in Kenya, Nigeria, Ghana, Colombia, Peru, Jamaica, Indonesia, and Burma.</p>	Infrastructure; Low Incomes and Affordability	Leveraging networks and convening and hosting discussions; Driving advocacy; Providing funding and capital; Building capacity

<p>World Wide Web Foundation¹¹</p> <p>https://webfoundation.org/our-work/</p>	<p>Projects listed here are past projects to give an indication of project types – new projects can be applied for subject to discussions</p> <p>The Web Index: First released in 2012, the Web Index ranks 86 countries yearly based on research into the web's global impact on four pillars: Universal Access, Freedom and Openness, Empowerment, and Relevant Content. The Index combines existing secondary data with new primary data derived from an evidence-based assessment survey.</p> <p>Women's Rights Online: WWW Foundation advocates for evidence-based national ICT and gender plans established in at least 7 new countries within 5 years, with a focus on 10 countries in Africa, Asia, and Latin America (starting in 2014) in order to address gender barriers in digital inclusion.</p>	<p>Cross Cutting incentives</p>	<p>Conducting research and establishing thought leadership; Driving advocacy</p>
<p>A4AI sponsored by USAID, Google, Omidyar Network, DFID, World Wide Web Foundation</p>	<p>Initiatives to address the high costs of Internet access through policy and regulatory reform with multi-stakeholder coalitions in the countries below; projects mostly in the research/work plan creation stages, some in policy proposal development stages. Funding levels unclear from public documents.</p>	<p>Low incomes & Affordability</p>	<p>Leveraging networks and convening and hosting discussions; Driving advocacy; Building capacity; Conducting research and establishing thought leadership</p>
<p>Facebook</p> <p>Express Wifi</p> <p>Free Basics</p>	<p>Free Basics</p> <p>Free Basics: Initiative to introduce people to the benefits of the Internet by providing free access to services like news, local jobs, etc. It is available in 48 countries with a variety of mobile operators.</p>	<p>Low incomes and Affordability; Incentives; Infrastructure</p>	<p>Developing and deploying technology solutions; Incubating and scaling innovative business models</p>

¹¹ World Wide Web Foundation delivers digital equality by securing policy change. Through partnerships and coalitions; Advocacy based on evidence; experimentation and innovation <https://webfoundation.org/our-work/>

	<p>Express WiFi-</p> <p>Globally, the initiative was launched in 2016, and has seen the introduction of affordable or free WiFi in many parts of the world.</p> <p>Launched in South Africa in 2017, Facebook’s Express WiFi programme aims to deliver Internet access to underserved areas in SA, by partnering with service providers and operators to expand the provision of fast, affordable and reliable access to the Internet over WiFi.</p> <p>According to Facebook, its mesh WiFi technology works with different wireless technologies, reducing the need for operators to spend time manually configuring their networks.</p> <p>Partners are able to integrate Facebook’s mesh access technology into their WiFi solutions and offer affordable WiFi bundles to subscribers.</p> <p>In SA, Facebook has an existing partnership with Cell C, which has seen it provide the first free access to the WiFi hotspots at the University of Western Cape. The hotspot is free for students on the campus.</p>		
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Figure 26: Annexure of Potential Partners
Source: Various sources, and partner websites