

INFORMATION AND COMMUNICATION TECHNOLOGY

INVESTOR FACTSHEET

INTRODUCTION

The Botswana Investment and Trade Centre (BITC) is an integrated Investment and Trade Promotion Authority with an encompassing mandate of investment promotion and attraction; export development and promotion including management of the Nation Brand.

Among its key responsibilities, BITC is charged with gathering intelligence and conducting research to sustain and enhance the competitiveness of Botswana. This includes publishing information relating to investment in, and exports from Botswana for Botswana to take advantage of the existing opportunities in and outside the country. We are therefore pleased to share the synopsis of Botswana's ICT sector profile.

OVERVIEW OF THE BOTSWANA ICT SECTOR

Botswana's ICT demands are significantly met by imports at present creating an import gap amounting to around USD42 million in 2014 alone. The ICT sector alone contributes between 2% and 5% of Gross Domestic Product.

The majority of ICT supplies and services are imported from South Africa and to some extent Europe and USA. According to official data, ICT imports of computer hardware less than 10kg (HS8471.30), laptops (HS8471.41), accessories (HS 8473.30), other storages (HS 8523.51) were valued consistently over USD30 million from 2012 to 2014.

At present there is little or no ICT exports from Botswana. Investors into Botswana's ICT sector will benefit from her being a member of SADC and SACU, enabling preferential targeting of diverse and more numerous export markets. Tripartite cooperation countries (COMESA, EAC, and SADC) account for half (27) of the Membership of the AU with a Gross Domestic Product of US\$1.3trn, a population of 565 million and a combined landmass of 17 million square kilometers is another market extension. Market access conditions are governed by the provisions of the SADC Trade Protocol and the larger TFTA.

Opportunity 1: Mobile Money (mMoney) and Banking the unbanked-a financial inclusion imperative

Globally, 2,5 billion adults have no bank accounts and most of them in developing countries. Africa has the highest remittance market in the world valued at almost \$40 billion by end 2016. Current costs of sending \$200 average 12.3% with 50% market share held by two players for ¾ of African countries. There is therefore an opportunity for a holistic product that can be used by consumers irrespective of their bank or public telecommunication operators (PTOs). Where a mobile phone doubles as an account number, enables transactions across networks and offer remittances across borders. A further opportunity exists to tap into a USD2 billion market of remittances in Southern Africa.

Opportunity 2: eWaste

E-Waste by definition is all types of electrical and electronic equipment (EEE) that have been discarded by the owner as waste. Although e-waste is a general term, it can be considered to denote items such as TV appliances, computers, laptops, tablets and mobile phones. Between 2011 and 2016, global eWaste will increase by 125% from 41.5 million to 93.5 million metric tons due to the following:

- a. the increased frequency at which they are replaced/ upgraded;
- b. the transition from feature phones to smart-phones;
- c. new technology and software (Windows 10, etc.); and
- d. replacement / upgrade from desktops to laptops and tablets.

The opportunity is to set up a complete eWaste management system through partnership between GoB, local councils, private sector. There can also be value addition to eWaste by the introduction of EPR (Extended Producer Responsibility) program following the example of developed countries. This is a prospect for PPP to bring awareness to the public, collect eWaste, set up collection infrastructure, set up re-use programs (with smart procurement) and develop recycle/export centres within this sector.

In Botswana, opportunities include information that 16,600 metric tons of eWaste are produced annually valued at \$2.3-12.5 million. Assuming a 10% modest increase in value after 10 years, the opportunity will be worth about \$6.0-32.3 million creating a potential 400-500 jobs. This assumption is based on the fact that Ghana processes over 10 times more amounts of eWaste creating 4500-6000 jobs. These opportunities also include the reuse of ITC equipment for local communities and schools and incentivised collection by implementing an “Extended Producer Responsibility” scheme.

Opportunity 3: TV White Space

TV White Space (TVWS) refers to the unused TV channels. These channels are used to be placed between active TV channels to protect broadcasting interference. It has been proven that these frequencies can be used to provide broadband internet access. The Non-Line-of-Sight: Signal achieves up to 10km coverage and propagates through trees, hills, walls and buildings, unlike WiFi's limited coverage. It allows for great coverage with minimal infrastructure capable of connecting many clients in a wide coverage area, with a relative small number of towers and infrastructure. TVWS devices can support up to 16 Mbit/s and are capable of connecting hundreds devices with one Base Station. In addition, the rural TVWS stations could be powered with solar panels that could also power local schools/community centres.

- Pilot programmes for TV White Space (TVWS) include South Africa (provide low cost internet to Limpopo communities), Ghana (first commercial TVWS broadband service), Kenya, Namibia (62km x 152km area), Philippines (dense forest area) and Botswana (Kgolagano). The benefits include the following;
- TVWS could be the catalyst for closing the digital divide
 - Enable more Batswana to be connected to WWW
 - Help more SMEs grow and connect to WWW
 - Become the enabler to develop e-services (Education, Commerce, Health, etc.)
 - Assist the roll out of local content mobile apps
 - Expanding infrastructure across Botswana could be leased or sublet to investors.

Other future opportunities are Telemedicine, eEducation, eVet (cattle, small stock, domestic) and Fleet management. Currently, the following companies are investing in TVWS; Google, Microsoft through Microsoft4Afrika programme, Adaptrum (hardware) and Carlson Wireless (hardware).

Opportunities that exist in Botswana are premised on the fact that 950,000 people, 43% of the national population lives in rural areas, most internet access is prohibited due to high cost and lack of infrastructure at \$15 for 800Mb of data. Mobile internet is still expensive, the cost of infrastructure is lower vs 3G, 4G and can be further subsidised by Kgolagano program. There is currently no need for a licence fee for TV white space and indicative retail prices as per Ghana example (Spectra Wireless) with unlimited data. The nominal speeds can reach up to 16Mbits/sec.

- \$7.5 per month ½x speed
- \$8.5 per week 4x speed
- \$0.75 per day 1x speed

	Rural population penetration	Monthly turnover per user	Total monthly Turnover	Annual Turnover
Scenario 1	10%	\$4.00	\$380.000	\$4.560.000
Scenario 2	20%	\$3.00	\$570.000	\$6.840.000
Scenario 3	30%	\$2.50	\$712.500	\$8.550.000



Opportunity 4: TV Broadcasting

In Botswana currently, a digital migration is happening. The Botswana Television(BTV) is the only free nationwide broadcaster while DSTV is a premium satellite broadcaster with estimated ~40-60,000 subscribers. There is an upward trajectory of the middle class who are seeking to get connected. DSTV satellite broadcaster bouquets prices increase rapidly every year and are prescriptive. Internet speeds increase leading to opportunity for TV streaming e.g. “triple play” packages. There is also a growing public interest in religious content, sports (South African football, NBA and beyond), local content (drama/comedy series and culture). In addition, due to the digital migration, there is an opportunity for private broadcasters and content producers (film producers).

Prospective opportunities include IPTV streaming video through internet (min 2.5-4Mbit/sec) and Video on Demand. Opportunities in ICT are premised on the fact that there are approximately 400,000 households in Botswana, and a rising middle class, currently 47% of national population seeking new ways of entertainment, the current satellite service provided by DSTV is expensive and prices increase an average 5-10% per annum, consumers try to close the gap by signing up to DSTV South Africa in grey market or purchasing Free to View decoders from South Africa, there is an opportunity for a private broadcaster to provide a value for money service to the growing middle class.

	Household penetration	Household monthly turnover	Total monthly turnover	Annual Turnover
Scenario 1	10%	\$10.00	\$400.000	\$4.800.000
Scenario 2	20%	\$7.50	\$600.000	\$7.200.000
Scenario 3	30%	\$6.00	\$720.000	\$8.640.000

Opportunity 5: eHealth

It is worth noting that there are few specialized medical doctors concentrated in large villages or main cities, there is low penetration of landlines and lack of computer facilities across the country. Batswana have been adopting mobile devices (phones, tablets) at an increasing pace. eHealth and mHealth are fast growing sectors that could benefit many millions of Africans. Botswana could provide an innovative entrepreneur the opportunity to develop the appropriate eHealth content. There is potential to pilot an eHealth software and management systems that will enable doctors to attend patients remotely.

There is an existing eHealth pilot project dubbed “Kgonafalo” which is a partnership between University of Pennsylvania, Botswana's Ministry of Health and Orange mHealth. The key focus areas for this pilot project include Women's Health, Dermatology, Radiology and Oral Medicine. The pilot project facilitates for Self-Care, which involves patients' use of mobile phones to enable adherence to medication and access to disease diagnoses and treatment information. The project also allows for Health Monitoring which involves the use of communication technology to enable communication in case of emergencies, mobilizing communities, provide healthcare professionals with access to information at the point of care and enabling the transmission of information and communication between healthcare professionals. The same project has the capacity to do Disease Surveillance which includes the use of mobile phones or tablets to detect and manage disease outbreaks allowing health workers to collect and communicate real-time disease occurrence information at a local level and share the data with centralized healthcare organisations, allowing health officials to promptly launch prevention and cure schemes, as well as analyse data.

Opportunities that exist in Botswana are premised on the following:

- Large size country. 580.000 sq. kilometres of areas, similar to France or Texas
- Public medical services not reaching remote areas
- Lack of specialised doctors and equipment
- Long delays seeking medical assistance
- Focus areas – Medical treatment:
 - Cardiac surgery (Heart)
 - Ophthalmology (Eyes)Nephrology (Kidneys)
 - Orthopaedics (Bones)
- Diabetes
- Spinal cord injuries
- Focus Areas – Manufacturing and analysis:
 - Diagnostics Facilities (Imaging and laboratory)
 - Pharmaceutical manufacturing
 - Biomedical equipment manufacturing

Opportunity 6: eCommerce

Additional opportunities in the ICT Sector include electronic commerce (eCommerce). This is the buying and selling of information, products and services via the internet. eCommerce started in Africa in the early 2000s and the three most popular market segments of eCommerce are crafts and artifacts (traditional and modern), online entertainment (movies, films) and Service providers (translators, computer programmers,

etc). The landscape is evolving with increased internet users, mobile broadband and advent of smart phones, spread of social media and cloud computing with hard to capture data. The value of electronic commerce in Africa is at \$18.5 bn.

Opportunity 7: Software and Apps Development

BITRI's ICT related research and development is dedicated to technology solutions and next-generation products in priority areas of health (mobile technology, mobile apps, telemedicine) outlining the following areas worth of investment.

- Education: provision of (interactive mobile solutions), eLearning and self-tests with standard tutorial questions, access to past examination questions, a platform for students and private tutors to interact and platforms for student interactions
- Agriculture: mobile solutions to markets, information, best practices, and platforms/solutions to connect farmers with markets, logistics and transportation services
- Transport systems; intelligent transportation systems such as application of road sensors, automated statistic gathering, driver assistance communications, driver/passenger information systems, road safety and obstacle detections, etc.
- Security and forensics: new measures to help in the criminal justice systems have never been much needed. Opportunities exist for appropriate digital evidence collection and handling, signal processing to obtain key issues from recordings, authentication and validation of data/automated identification systems, training dedicated to responsible officers, and public awareness
- Tourism and culture: development of applications to provide intelligence on lodges locations and routes, attraction facilities, mobile devices interfaces to tourism portals, among others
- ICT: development of new communication methods and signal processing techniques for optimal frequency and spectrum allocations through spectrum sensing algorithms, radiation level testing for safety, cognitive networks and internet.

Opportunities in Botswana are premised on the fact that 1.1% of GDP is the average eCommerce value in Africa at a value of \$18.5 billion. This is half of the current value in developed world. 1.4% of GDP is the value of eCommerce in South Africa, 3.3% of GDP is the value of eCommerce in Senegal the African champion, unfortunately there are no statistics for Botswana but it is expected negligible. The scenario below presents an opportunity based on a GDP of \$15.5 billion.

	Percentage of GDP	Equivalent territory	Annual Opportunity	Value for BW
Scenario 1	1.1%	Africa		\$173.800.000
Scenario 2	1.4%	South Africa		\$221.200.000
Scenario 3	2.2%	Kenya		\$347.600.000
Scenario 4	3.3%	Senegal		\$512.400.000

Opportunity 8: BPO, Call Centres

There is a generous investment climate offered by IFSC dispensation under the operation of BPO, Call Centres. However, there is a declining cost of voice and data due to investments made by BOFINET. Botswana has a well-educated, English speaking labour pool ready to be employed by Business Process outsourcing companies and contact centres that serve clients in English speaking countries. Relative to Philippines, Botswana is not affected by harsh environmental factors like floods which is a regular phenomenon there and there are no limitations on foreign ownership relative to South Africa. Botswana's geographical location in Southern Africa is ideal for the establishment of regional Business Process Outsourcing entities or Contact Centres to serve the Southern African Region.

Botswana's best place to find jobs - An employment platform for Botswana and Africa designed to allow employers to post job adverts and job seekers to search for jobs. A cost effective advertising solution available on all platforms (online, mobile phones, tablets etc). The site is easy to use so that your entire HR and Recruitment team can advertise jobs and search for candidates directly. The website is accessible on www.careerpoolbotswana.com.

As far as the time zone is concerned, Botswana falls within the Central African Time (CAT) zone which is GMT + 2 and this along with other factors make Botswana a convenient offshoring location for African and European firms to name a few. This time difference with other countries such as the USA allows for the timely processing and completion of BPO tasks such as Data Mining, Data Cleaning and Salary Processing.

Precise opportunities that exist in Business Process Outsourcing and Call Centers in Botswana include a vast array of telecommunications services such as; International Private Leased Circuits, IP VPN and other voice, data and multimedia services essential to the BPO and Contact Centre Industry are available at competitive rates through licensed Public Telecommunications Operators and providers of Value Added Network Services. Another advantage is that licensed service providers are permitted to provide Voice over IP services. The further liberalization of the Botswana Telecommunications sector has led to service providers offering services at competitive rates and high standards of quality. The Government of Botswana is participating in the following international connectivity projects to ensure that the cost and quality of telecommunications services meets international standards;

- The West African Festoon Cable System (WAFS) is a planned project which consists of an optic fibre cable that will run along the western seaboard from Luanda in Angola landing at Congo, DRC, Gabon, Togo, Equatorial-Guinea and through to Bonny in Nigeria. From Nigeria, onward connectivity to the rest of the world will be achieved through the existing submarine cables terminating there.
- The East African Submarine System (EASSY) is another system that consists of a fibre cable that will run from Mtunzini in South Africa, and will continue Northwards, branching out to Mozambique, Madagascar, Tanzania, Kenya, Somalia, Djibouti, and terminating at Port Sudan in Sudan.
- The West African Cable System (WACS) connecting Cape Town in South Africa with landing stations in Namibia, Angola, the Democratic Republic Of Congo, Cameroon, Nigeria, Ghana, Cote d'Ivoire, Portugal and terminating in London in the United Kingdom.

The completion of the SEACOM project has seen bandwidth costs reduced considerably by the last quarter of 2009. The Botswana Innovation Hub is a technology park which offers state of the art, world-class infrastructure. Botswana boasts a highly capable pool of certified telecommunications equipment and software suppliers with qualified Engineers across all facets of Information Communications Technology. The Botswana ICT Skills base is proficient in Microsoft, Cisco, Avaya etc.

Opportunity 9: ICT in Agriculture

The Information and Communication Technologies (ICTs) have the potential to transform business in Africa, growing entrepreneurship, innovation and economic growth. The use of modern communication tools can reduce the overall cost of transactions, access to market, improve communication and assist producers and traders in terms of market intelligence across the value chains. The ICT can become the enabler towards more sustainable and scalable agricultural projects exceeding previous estimates. Cell phones have been a prime example of how value added information, written and verbal can become easily accessible.

Opportunity Area	Benefit	Existing examples
Market intelligence, price information	Assistance with decision making when to harvest, to sell, negotiate prices	<ul style="list-style-type: none">• Esoko (sub-Saharan Africa)• Manobi (Senegal)• Infotrade (Uganda)• Zambian National Farmers Union MIS (Zambia)• BMC SMS-based price alert (BW)

Traceability, distribution and supply chain management	Increase efficiency and reduce wastage. Assist value chain participants by providing tracking information along the value chain.	<ul style="list-style-type: none">• Dunavant Cotton (Zambia)• Infosys system for horticulture (India)• SourceTrace (Costa Rica, Mexico)• LITS (Botswana)
Financial Services (mobile payment, mobile money)	Make financial transactions more accessible, faster, and safer. Bank the underbanked	<ul style="list-style-type: none">• M-Pesa (Kenya)• Orange Money, Mascom MyZaka (Botswana)• WIZZIT (South Africa)
Farm extension services, access to sector knowledge and information	Deliver better extension services, relieve extension officers, bring knowledge and information closer to farmers	<ul style="list-style-type: none">• Modisa (Botswana)• Farmer Voice Radio Project (Kenya)• IFFCO/Kassan Sanchar (India)• Radio (Mali)
Commodity exchanges	Provide transparency in commodity pricing, promote fair trade between buyers and sellers. Reduce wastage through more efficient transportation and reduced transportation costs.	<ul style="list-style-type: none">• Ethiopia Commodity Exchange (ECX)• Uganda Commodity Exchange• Zambian Commodity Exchange (ZAMACE)• Botswana Horticulture Market?

Opportunities in Botswana are premised on the fact that Botswana's cattle population is estimated at 2,25 million heads, 88% of the cattle population is owned by traditional farmers, \$45 is the difference in the profit per cattle slaughtered between traditional and commercial farmer. ICT can help bridge the profitability gap for traditional farmers by offering better market intelligence including price information, effective traceability system along the value chain, farm extension services and commodity prices.

	Close the profit gap by:	Added value to value chain
Scenario 1	5%	\$9.900.000
Scenario 2	10%	\$19.800.000
Scenario 3	15%	\$29.700.000
Scenario 4	20%	\$39.600.000

DISCLAIMER:

These opportunities and estimates provided on this brief are calculated based on current available knowledge. Further investigation is recommended to evaluate the size of the opportunities in ICT more accurately. For the detailed ICT Value Proposition visit our Information Resource Centre or contact us on the contacts below.

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