Innovation Diplomats

Freetown, Sierra Leone

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Executive Summary

Sierra Leone recently underwent a peaceful transition of power where the opposition won the general elections by a narrow margin, demonstrating the country's strengthening democratic institutions. President Julius Maada Bio created the Directorate for Science, Technology and Innovation (DSTI) and appointed MIT Alum David Sengeh as the country's first Chief Innovation Officer, with a mandate to transform Sierra Leone into an innovation nation. DSTI is expected to become the much-needed champion of science, technology and innovation (STI) and help create the conditions for entrepreneurs, academia, investors, the corporate sector, and government to succeed in transforming Sierra Leone. The report outlines where each of the afore mentioned stakeholder group stands presently, what the bottlenecks to STI are, and what could be done to address them.

Introduction

This report stems from research conducted in July 2018 in Freetown, Sierra Leone following an invitation by MIT Alum David Sengeh, Sierra Leone's first ever Chief Innovation Officer appointed by President Julius Maada Bio to head the newly created Directorate for Science, Technology and Innovation (DSTI)[1] created in 2018. I was invited by DSTI with the objective to conduct a brief assessment of the science, technology, and innovation (STI) scene in Freetown in order to both suggest recommendations to

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[1] http://dsti.gov.sl/

strengthen the local ecosystem as well as to identify opportunities to engage STI stakeholders in Switzerland and the United States to build capacity and identify avenues for collaboration, leveraging my professional experience in science and technology diplomacy with swissnex Boston[2].

Sierra Leone is situated in West Africa, sharing borders with Liberia to the southeast and Guinea to northwest, while the southeast of the country faces the Atlantic Ocean. It is known as the world's roundest country[3] and is home to 7 million people. Its largest city and capital is Freetown; situated in the west of the country it is home to 1 million people and enjoys one of the world's largest deep water natural harbors – a natural asset with an economic potential significantly above its current use. Sierra Leone was a British colony from 1800 until independence in 1961, and the British colonial heritage is still present, with English being the official language and the country's institutions resembling those of Britain.

Sierra Leone's population is estimated to be 60 percent Muslim, 30 percent Christian, and 10 percent Animist and the country is known for its religious tolerance, something that emerged in numerous conversations I had, and that I was also able to observe in several instances. The country's President is a practicing Roman Catholic, while the First Lady is a practicing Muslim; David Sengeh mentioned how is young daughter was attending both Muslim as well as Christian services with family members of both faiths, and I observed some Muslim taxi drivers displaying Christian symbols in their cars, or listening to

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[2] https://www.swissnexboston.org/
[3] https://kenopalo.com/2018/05/11/sierra-leone-is-the-roundest-country-in-the-world/

Christian prayers on the radio. While religious tolerance may not necessarily be tied to a country entrepreneurial scene, it is important aspect to highlight this aspect of Sierra Leone as it may be of relevance in terms of assessing the country's stability. Furthermore, Sierra Leone's civil war from 1991 to 2002 was not fought along religious lines.

Sierra Leone's GDP was estimated at $3.6 billion[4] in 2016 (Figure 1) after peaking at $5 billion in 2014. The recession started with the Ebola outbreak of 2014[5] which significantly affected Sierra Leone and its neighboring countries, causing a 20 percent GDP drop in 2015 (Figure 2). Figure 1 shows how Sierra Leone was able to capitalize on the end of the civil war and significantly grow its economy from the early 2000s until the Ebola outbreak in 2014. Figure 1 – Sierra Leone GDP
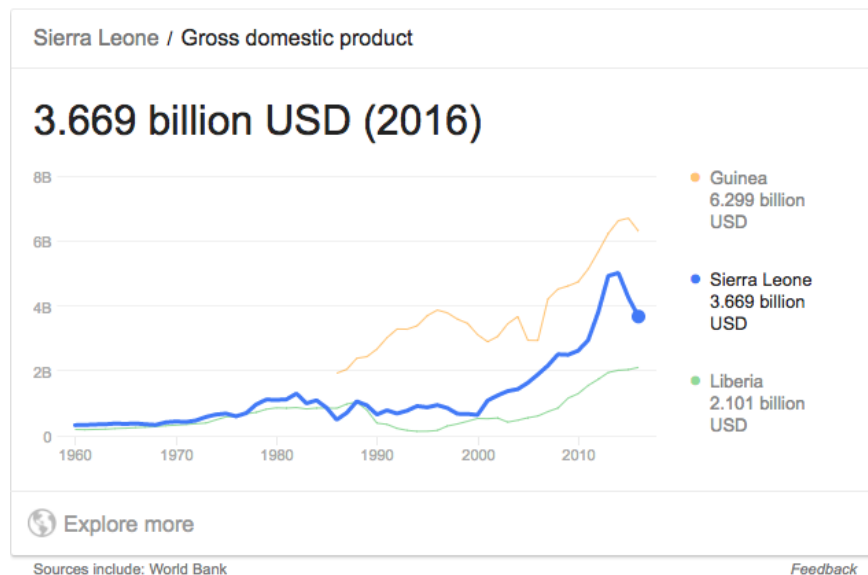

Figure 2 – Sierra Leone GDP Annual Change

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[4] https://data.worldbank.org/country/sierra-leone
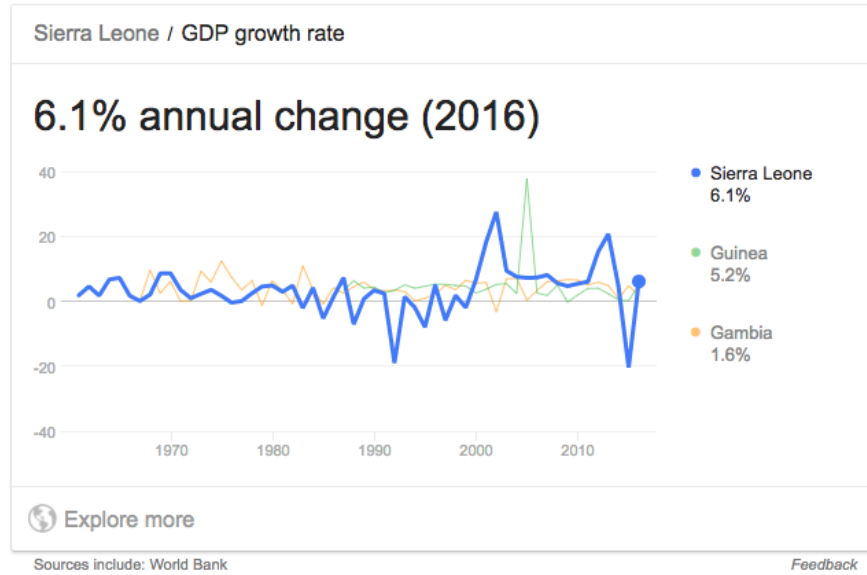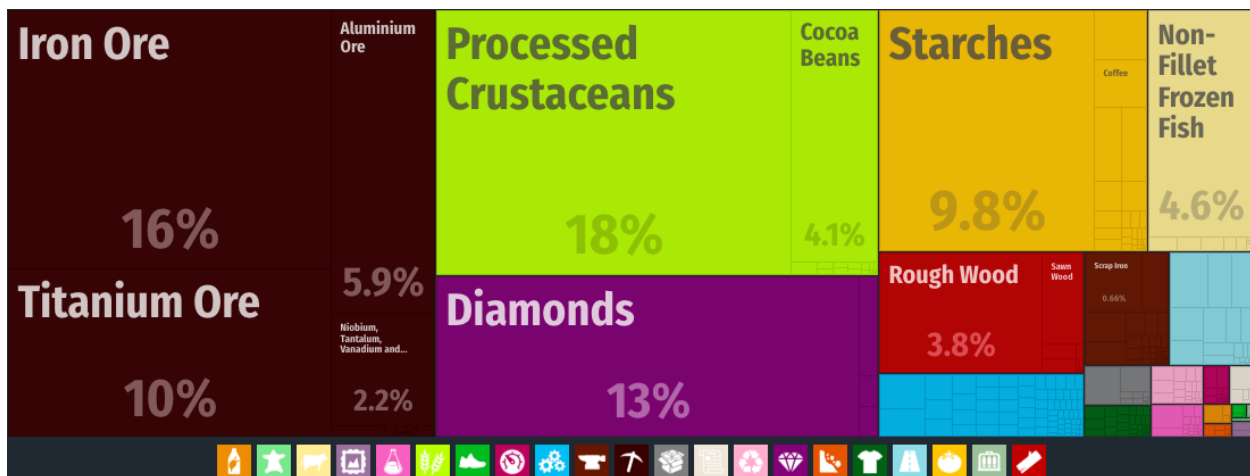[5] https://en.wikipedia.org/wiki/West_African_Ebola_virus_epidemic

Figure 3 – Sierra Leone GDP Per Capita

Sierra Leone's GDP per capita is about $500 (Figure 3), and it is estimated that 60 percent of the population live below the poverty line of $1.25 per day. Reliable data indicators for Sierra Leone are scarce, but the country is not known for training large amounts of students in STEM or for investing significantly in R&D. This means that the context within which Sierra Leone will build innovation and entrepreneurship capacity is severely constrained. At the same time, the economic complexity of Sierra Leone is quite small,

with much of the country's post-civil war growth being fueled by natural resource extraction (in particular iron ore) and high commodity prices. Figure 4 shows a snapshot of Sierra Leone's exports in 2016[6], demonstrating how the economy is fueled by low-value added activity. Agriculture is the country's largest sector with 80 percent of the population employed in it and over 60 percent being subsistence farmers. Sierra Leone's path towards middle-income level will likely depend on commodity prices and its ability to diversify its economy and move towards more complex and value-added activities. Building STI capabilities will be paramount to capturing those opportunities, driving investment in human capital. In parallel, Sierra Leone will need to strengthen its infrastructure (power and roads) and its regulatory environment (ease of doing business, currently ranked 160th of 190[7]) to climb the complexity ladder.

Figure 4 – Sierra Leone's Exports in 2016

In 2018 Sierra Leone experienced a positive development for its democratic governance when it held general elections that led to a peaceful transition of power, with the opposition winning the presidency on a narrow 52-48 percent margin. This demonstrates Sierra

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[6] https://atlas.media.mit.edu/en/profile/country/sle/
[7] https://tradingeconomics.com/sierra-leone/ease-of-doing-business

Leone's progress in democratic governance, as this was the first fully independently administered general election since the end of the civil war in 2002.

Following this general introduction to Sierra Leone, the report will delve into the stakeholder analysis of its innovation and entrepreneurship capacity.

Methodology

The analysis presented in this paper follows the framework of the MIT Lab for Innovation Science and Policy[8] developed at the MIT Innovation Initiative. It follows the questions listed in Figure 5 to the stakeholder groups outlined in the left column.

Figure 5 – Innovation Diplomats Questionnaire

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[8] https://innovation.mit.edu/research-policy/lab-innovation-science-policy/

	Guiding Questions:
Government	1. What do you feel is the government's role to promote entrepreneurship on technological innovation in your region, if any? 2. What are the different roles for federal government, state government, and municipal government? 3. What policies and/or programs has your branch of the government (or another branch) put into place to encourage entrepreneurship or technological innovation? (visa policy, grants, etc) 4. What is the biggest piece of 'red tape' in the government that keeps people from starting businesses? 5. In what ways, if any, does your government agency participate with other stakeholders in the region?
University	1. Does your university have a center to encourage entrepreneurship in students? Has it ever been considered? Who funds it? 2. Does your university have a center dedicated to commercializing technology? 3. Do you offer courses on entrepreneurship? 4. In what ways, if any, does your university participate with other stakeholders in the region?
Entrepreneur	1. Why did you decide to start the kind of business you did? 2. Why did you decide to physically locate your business where you did? 3. How long did it take to start your business? Why? 4. What is the cultural stigma around entrepreneurship in your region? Why? 5. Did you pursue risk capital when you started or did you bootstrap? Why? 6. Did you have formal entrepreneurship training?
Risk Capital	1. How many types of venture/risk capital firms are in this region? 2. Does your firm focus on a particular industry to fund? 3. How do you decide which startups to fund?
Corporate	1. Does your company partner with other stakeholders in your region in any way to promote entrepreneurship? 2. Does your company offer grants or prizes of any kind to innovators in your region? 3. Does your company feel it can benefit from new entrepreneurial spirit in your region? Why or why not? 4. What services does your company offer that lay the foundation for innovation in your region? Infrastructure? Communications? 5. Does your company promote 'intrapreneurship'? (having employees act like entrepreneurs within your company)

I plan to complement the research conducted so far with a follow up visit in January 2019, with the objective of including a chapter on Sierra Leone in my thesis investigating science and technology innovation ecosystems in sub-Saharan Africa. I recognize that the analysis conducted so far is partial and will need to be developed further.

Key Findings

Sierra Leone's innovation ecosystem is in an embryonal phase and should really be considered at an inception point. The country has no track record of fostering startups and providing them with an enabling environment (mentorship, funding, and other resources). The most promising entrepreneurs often leave the country for other regional markets such as Lagos in Nigeria, or Accra in Ghana to develop their entrepreneurial solutions. This was the case with Edmond Nonie, a young entrepreneur and founder of Track Your Build[9], an end-to-end construction platform that offers services that take its clients through the entire construction life cycle from surveying and buying land, to architectural and engineering design to construction of their project. While Track Your Build is based in Freetown, Edmond had left for Lagos before returning to Sierra Leone. What follows is an analysis and overview of each stakeholder group in Freetown.

Enabling Environment for Entrepreneurs

Freetown's technology entrepreneurship scene is nascent; the city currently features only one technology hub, Sensi Tech Hub[10] located in what used to be a night club, serving a community of approximately 100 people. Sensi describes its work as "building a technology innovation community in Sierra Leone that will drive economic and social development through providing an open and stimulating community hub for young technologists and entrepreneurs to come together, develop their ideas and access

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[9] http://tybprojects.com/
[10] http://sensi-sl.org/

cutting-edge tech, events, incubation programmes and training. Sensi will unleash the untapped potential of young people interested in building businesses and making a difference in their careers." Sensi provides access to a coworking space to its members who pay a small fee, where they have access to power as well as a network of like-minded individuals. In addition, Sensi works on ICT capacity building by offering training to young people interested to enter the technology field. At Sensi one can learn to code, develop apps, and get some basic training in entrepreneurship. Sensi was founded by Morris Marrah, a young Sierra Leonean who returned to Freetown from London during the Ebola crisis with a desire to contribute to tackling the public health crisis. He founded Sensi and developed mobile solutions to track Ebola outbreaks and to streamline the public health response, together with the nascent community around Sensi. To date the hub's work is informed more by its track record of addressing humanitarian or civic shortcomings, rather than by exploiting market-based opportunities, leading its community to be more minded towards social innovation rather than market-based entrepreneurship. This trend of an entrepreneurial mindset adapted to social challenges was observed also in Ghana, Kenya, and Tanzania (other countries that I visited this summer where I conducted similar interviews). In Sierra Leone this aspect was definitely strongest, and it is likely that is largely influenced by the presence of NGOs and a large aid-community in the country. According to UNDP, Sierra Leone "remains heavily dependent on aid, with about 50% of public investment programmes financed by external resources"[11]. A strong NGO presence and aid-fueled economy can definitely be a hindrance to developing an entrepreneurial ecosystem, since donor agencies tend to set agendas and dictate

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[11] http://www.sl.undp.org/content/sierraleone/en/home/countryinfo.html

priorities, with entrepreneurs adapting their solutions to the priorities of donors, whose funding is geared more towards social innovation (for example developing an SMS system similar to Frontline SMS[12] to respond to the Ebola outbreak; something extremely useful from a social perspective, but lacking a viable business model and thus dependent on donors). This point was raised also by a number of stakeholders interviewed in Nairobi, Kenya who noted a general trend towards social innovation or social entrepreneurship with numerous young innovators developing promising solutions to specific challenges, but failing to find viable business models to commercialize their solutions. Universities tend to favor social innovation and social entrepreneurship too, as that is where they can get funds to support student projects addressing specific pre-defined challenges near and dear to the donors.

Sensi recently organized hackathons ahead of the elections seeking to develop civic solutions to electoral challenges, another example of its focus on social innovation rather than market opportunity driven entrepreneurship. Funding for Sensi's programming comes from donor agencies and in small part from its members. Furthermore, Sensi offers technology consulting services to various public and private stakeholders to raise revenue.

Beyond Sensi Tech Hub, Freetown will see the launch of Innovation SL[13], the city's first real incubator and accelerator in late 2018. Francis Stevens George (grandson of Siaka Stevens, the country's Prime Minister from 1967 – 1971 and first President from 1971 –

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[12] https://www.frontlinesms.com/
[13] https://innosl.com/

1985) leads the creation of Innovation SL, a hub that will be affiliated with the Global Entrepreneurship Network[14] of which Francis Stevens George is a member. Innovation SL plans to take over a large commercial building near downtown Freetown and to develop a network of mentors and funders to support its entrepreneurs. Innovation SL will focus on supporting entrepreneurs working on ag-tech and digital technologies, as well as ones working on circular economy business models[15]. Innovation SL is developing a partnership with Limkokwing University of Creative Technologies[16] around its Limkokwing Entrepreneurship Accelerator Platform (LEAP) to exploit synergies between student projects and the accelerator. Limkoking is a Malaysian university with over 10 campuses around the world that opened one in Sierra Leone in 2016. The university has a focus on practical education with students learning in a project-based environment. According to Francis Stevens George Limkokwing "is the go to university for those with a mindset of innovation and entrepreneurship".

Working together with Francis Stevens George is Sheka Forna, the Executive Director of ReGrow West Africa, "a Global Development Alliance, funded by Chevron and USAID, and implemented by RESOLVE[17] with support from GIZ[18] and Cordaid[19], to revitalize private sector development in Sierra Leone to promote and protect local employment and livelihoods and to help local and regional stakeholders re-grow their economies in

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[14] https://genglobal.org/
[15] https://www.ellenmacarthurfoundation.org/assets/downloads/ce100/CE100-CoPro-BE_Business-Models-Interactive.pdf
[16] https://www.limkokwing.net/sierra_leone/
[17] www.resolv.org
[18] https://www.giz.de/en/html/index.html
[19] https://www.cordaid.org/nl/

sustainable, equitable and resilient ways." Together with Francis Stevens George, Sheka Forna founded the Freetown Pitch Night[20] in 2017, organizing a monthly pitch night that aims to bring together the entrepreneurial community of the city. Freetown Pitch Night is Sierra Leone's first regular monthly gathering of the entrepreneurship community. The latest pitch night held in July was a "Mayor's Pitch Night Special" featuring Freetown's new Mayor Yvonne Aki-Sawyer who challenged the community to develop entrepreneurial solutions to the city's waste management, sanitation, and housing challenges. Growing Freetown Pitch Night by reaching more people and developing the accelerator and incubator will equip Freetown with important elements to grow its STI ecosystem.

Unfortunately, there were not many examples of technology entrepreneurs who succeeded in Freetown. Sensi Tech Hub is working with very early stage entrepreneurs developing projects such as an app to allow travelers to book a ticket for the motorboat ride to Freetown Airport from a mobile platform or online, or a service to refill ink cartridges for businesses instead of purchasing new ones. When it came to more mature technology companies, those known by most in Freetown are Track Your Build (Edmond Nonie mentioned earlier), IDT Labs[21] (Salton Massally), and Integems[22] (Julius Mattai). IDT Labs "is an ICT company with a focus on envisioning, designing and implementing technology solutions for development in West Africa. Since 2013, IDT Labs has been delivering customized ICT solutions for governments, organizations and businesses

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[20] https://www.freetownpitchnight.com/
[21] https://idtlabs.xyz/
[22] http://www.integemsgroup.com/

wanting to tackle social, developmental, and economic challenges." Integems "aspires to integrate innovative Geographic Information Systems (GIS) and remote sensing technologies with geo-information, environmental management and research expertise to effectively and efficiently respond to socio-economic, environmental and natural resource management challenges and opportunities." Integems gets contract work from NGOs, government agencies, and mining companies to conduct assessments, while IDT Labs works with financial institutions and government to provide custom solutions. While these companies are technology based, they act more as consultants rather than as creators of ideas new to the world. Since the technological gap in Sierra Leone is quite substantial there are numerous opportunities for organizations like IDT Labs and Integems to provide technological solutions and in the process raise the human capital and introduce new technologies and capabilities into the country.

Other organizations that work towards strengthening the STI scene are the Student Entrepreneurship Program Sierra Leone[23] which aims to provide online entrepreneurship education and Innovate Salone[24], an organization with strong links to MIT whose aim is to ignite and support the creativity in Sierra Leone youth.

Universities

Freetown is home to several universities, the largest of which is the University of Sierra Leone which is composed by several different entities: the Institute for Public

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[23] http://www.sep-sl.org/
[24] http://innovatesalone.org/

Administration and Management (IPAM)[25], Fourah Bay College[26] (the first Western style college in West Africa founded in 1827), the College of Medicine and Allied Health Sciences (COMAHS), as well as by other universities such as Njala University[27], BlueCrest College[28] (focused more on professional education in ICT), Limkokwing University, and the University of Makeni[29] (situated 2 hours north of Freetown with an MBA program focusing on entrepreneurship). Academia is definitely lagging behind in supporting and enabling the STI scene. Universities don't have innovation spaces, and whatever entrepreneurship training there is, it is hard to see the results of it in the marketplace, as most entrepreneurs are returning diaspora Sierra Leoneans. Of note are Limkokwing University, with its LEAP program mentioned earlier and the partnership with the Innovation SL accelerator and incubator, and IPAM's plan to allocate a floor of a new building towards an innovation space for students to pursue entrepreneurial opportunities and get access to resources such as a maker space (I was told there is one 3D printer in Sierra Leone currently) and training.

Risk Capital

As an aid dependent economy Sierra Leone is yet to develop a scene of investors willing to commit funds towards technology ventures. Numerous conversations mentioned Cordaid and its program to support SME Ventures[30], where funding and training are

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[25] https://en.wikipedia.org/wiki/Institute_of_Public_Administration_and_Management
[26] http://fourahbaycollege.net/
[27] https://njala.edu.sl/
[28] https://sl.bluecrestcollege.com/
[29] http://unimak.edu.sl/wordpress/
[30] https://www.cordaid.org/media/medialibrary/2015/03/SME-Ventures_2pgr.pdf

provided to entrepreneurs, but not with a focus on science and technology entrepreneurship; and Ecobank[31], a pan-African bank where technology entrepreneurs have been known to get loans (but not necessarily investments). During an interview with Village Capital[32] in Nairobi, Kenya I was told that there are plans for a pilot project in Sierra Leone in 2019. Village Capital "is a venture capital firm that finds, trains, and invests in early-stage ventures solving major global problems in agriculture, education, energy, financial inclusion, and health". It is likely that there are a few more funders in Sierra Leone, but in general it is hard to consider the funding available as proper risk capital, as it is mostly tied to donor agencies whose KPIs are very different from those of traditional risk capital. While the funding situation in Sierra Leone is quite unique because the private sector is so weak, I observed this dichotomy between donor funding and traditional risk capital also in Ghana and Kenya. Kenya has the strongest risk capital scene with numerous investments funds present to fund ventures at various stages (angel, pre- and post-revenue), although most risk capital seems to come from international investors rather than Kenyan ones, who still prefer to pursue traditional investments such as real estate as opposed to technology ventures.

Corporate Sector

The corporate sector, in particular the ICT sector could play an important role in supporting Sierra Leone's nascent STI ecosystem. Major telecom providers are Africell[33]

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[31] https://www.ecobank.com/
[32] https://vilcap.com/
[33] http://www.africell.sl/

(Lebanese owned) and Orange[34] (French owned). Africell became the dominant mobile provider by aggressively pursuing rural customers throughout the country, which led urban ones to switch to Africell in order to communicate with their relatives in rural areas at the cheapest rates, but according to numerous conversations it is not leading in its investments to strengthen the telecommunications infrastructure. Orange conversely is said to invest significantly in its mobile infrastructure. While most of the country is connected via mobile phone, mobile money has yet to be largely adopted by the population, which still fears that network connectivity issues may compromise the reliability of mobile money solutions.

Among Internet Service Providers (ISPs) I interviewed Afcom's founder Adel Suleiman, a Sudanese entrepreneur who has been working in Sierra Leone for decades. Afcom[35] is one of the country's main ISPs, and the company is moving rapidly towards automation, as a result of numerous challenges it faces in the country. After hiring and training local workers for numerous years, Suleiman decided to reduce Afcom's local workforce because of the high tax rate and trust issues with workers who preferred to be hired as contractors rather than employees (to pay lower income taxes). But hiring them as contractors allowed them to work for competitors and because of weak legal protections Afcom suffered losses due to intellectual property theft, which led to hiring international consultants first, and increased automation now. For the time being Afcom does deliberately not play an enabling role in the local STI scene, because the it considers the business environment to be unfavorable and would want to see some reforms before

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[34] http://www.orange.sl/
[35] http://www.afcom.sl/

revising its role. At the same time the organization is investing in new products and services such as a tier 3 data center[36] and MyPay[37], a digital wallet that works across platforms and providers (with the support of IDT Labs).

Sierra Leone's poor performance in the ease of doing business ranking (160th)[38] demonstrates how significant improvements are needed in the general business climate before the corporate sector can be fully leveraged as a supporter and enabler of the STI ecosystem. These reforms rest more on political will and administrative skill on the side of the government.

Government

There is a very tangible optimism and sense of excitement among numerous stakeholders in Sierra Leone resulting from the creation of the Directorate of Science, Technology and Innovation (DSTI)[39] and the nomination of David Sengeh as the country's first Chief Innovation Officer (CIO). An often-repeated point was that Sierra Leone needs an innovation champion, someone with the ability to strengthen the community and set collective priorities, and many believe that the country's new CIO is the right person at the right place at the right time. DSTI's vision is "to use science, technology and innovation to support the Government of Sierra Leone to deliver on its national development plan effectively and efficiently; and to help transform Sierra Leone into an innovation and

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[36] https://en.wikipedia.org/wiki/Data_center#Data_center_levels_and_tiers
[37] http://sierraleonefintech.org/about-us/
[38] http://www.doingbusiness.org/rankings
[39] https://dsti.gov.sl/

entrepreneurship hub." DSTI plans a cross-disciplinary approach, merging the National Development Plan with citizen engagement and the development of technical and applied solutions. DSTI will work on 4 strategic pillars from 2018 to 2023:

- Data for decision-making to support governance through analytical methods and visualization tools

- Data systems and technology design to enable secure collaboration and cross-sector planning and collaboration within government

- Service delivery and citizen engagement to deploy solutions that address citizen needs and facilitate their engagement with government

- Ecosystem strengthening to support a culture of innovation and entrepreneurship through initiatives, investments, and incentives for individuals, startups, and industry

One of DSTI's goals is to improve Sierra Leone's ease of doing business ranking by 50 places within 2 years, by working with the Office of the President, the Ministry of Trade and Industry and the World Bank to facilitate an effective and transparent business environment, including the development of cloud services and process digitization. In parallel, DSTI will launch a governance digitization initiative aimed at "developing systematic and comprehensive tools for the digitization and automation of governance". To strengthen the STI ecosystem DSTI will focus on youth innovation and entrepreneurship opportunities by developing a set of programs for 500,000 youth and a set of spaces for startup incubation within the next 18 months. These will include:

- An expanded national youth innovation challenge and maker camp for problem-solving and skills development

- An entrepreneurship center for academic research and startup resources (likely at IPAM)

- Startup capital

To capture the imagination of Sierra Leoneans and the international community, efforts are underway to develop the world's first national government secure quantum encrypted network using the existing fiber optic network in collaboration with ID Quantique[40], MIT, and numerous other organizations.

It was clear throughout my interviews, as well as by attending several meetings with the CIO, that the creation of DISTI and its ambitious agenda are sending positive shockwaves across Sierra Leone's STI stakeholders. DSTI is expected to lead Sierra Leone's transformation and everyone's eyes are on what will come out of this newly created unit, with many waiting for an opportunity to engage with its activities. As a newly born government unit with just a couple of months in activity, it remains to be seen to what extent DSTI will be able to fulfill its vision.

Recommendations

Sierra Leone's size and the embryonal state of its STI ecosystem offer an exciting opportunity to transform into an innovation and entrepreneurship enabled country. Its small size allows for levels of coordination and coopetition that are much harder for more populous countries and cities. Strengthening formal and informal knowledge networks

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[40] https://www.idquantique.com/

should be a key priority at this early stage, as ensuring that key people are connected with each other and talking regularly will be of critical importance. To do that, DSTI should be a convener to bring people together, going beyond the reach of the Freetown Pitch Night. WhatsApp groups should be created for key decision makers and influences to informally exchange ideas and consult on strategy. WhatsApp groups have emerged as a key informal knowledge exchange network across the countries I visited. In Ghana, a STEM WhatsApp group was instrumental in ensuring that the Ministry of the Environment, Science, and Technology (MESTI) would hear perspectives from STEM experts outside government that would normally not be consulted by ministries, leading to policy outcomes more closely aligned with the needs identified by the true experts.

In addition to strengthening informal networks, it will be important to have both an open doors policy for bilateral conversations with STI stakeholders, pursuing talks both with those eager to connect as well as proactively pursue talks with those who may be more skeptical or feel alienated from the government's policies. In addition to bilateral conversations, instilling a sense of community by organizing public forums for both STI stakeholders as well as students and the general public will be important, as a large part of strengthening the ecosystem has to do with a change of mindset, instilling a sense of possibility among young people in particular.

Beyond the domain of STI, it will be of critical importance for Sierra Leone to embark on a path away from aid-dependency and towards a market economy. Efforts should be undertaken to re-orient donor priorities towards greater alignment with the priorities of

Sierra Leone's STI ecosystem, ensuring that entrepreneurially minded people think about innovation and entrepreneurship particularly in terms of business models and market opportunities. This could lead to more foreign direct investment and other investmetns driven more by market opportunities, rather than aid funding to address market failures.

University and education reform are particularly important, as they are the suppliers of human capital and talent. Curricula and priorities should be updated and upgraded reflecting the critical thinking skills necessary to thrive in the 21st century. Sierra Leone needs more homegrown entrepreneurial talent, as many of its more successful entrepreneurs are either returning diaspora or foreign born. Building capacity in the education sector, be it in higher education or technical and vocational education and training (TVET) should be a priority for educational institutions, who should pursue collaborations with international counterparts leveraging Sierra Leone's bold transformation plans as an incentive to engage with them. Pursuing unconventional partnerships, such as a collaboration with BBC Media Action to create an entrepreneurship curriculum to be deployed throughout the country via radio should also be explored.

In sum, a systematic approach is needed to strengthen the STI ecosystem in Sierra Leone. Recognizing it as a complex adaptive system with interdependent components and applying an entrepreneurial trial and error approach could enable Sierra Leone to leap forward in ways that are hard to foresee.

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- Edmond Nonie, Track Your Build

- Salton Massally, IDT Labs

- Morris Marah, Sensi Tech Hub

- Mohamed Ibrahim, Sensi Tech Hub

- Young entrepreneurs, Sensi Tech Hub

- Sheka Forna, ReGrow West Africa

- Francis Stevens George, Innovate SL

- Rebecca Wood, BBC Media Action

- Joe Abbas Bangura, Africell

- Shane O'Connor, UNICEF

- Adel Suleiman, Afcom

- Julius Matta, Integem

- Mohamed Wurie, Cordaid