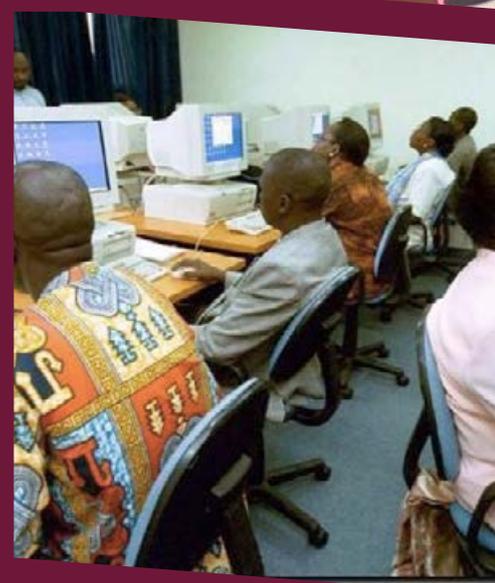




Republic of The Gambia

Youth and Trade Roadmap of The Gambia 2018-2022

Information and Com- munication Technologies Sector



YOUTH AND TRADE ROADMAP OF THE GAMBIA
INFORMATION AND COMMUNICATION TECHNOLOGIES SECTOR
2018-2022



Republic of The Gambia

This Youth and Trade Roadmap for Information and Communication Technology (ICT) forms an integral part of The Gambia's Youth and Trade Roadmap. It was developed under the aegis of The Republic of The Gambia, and the leadership of the Ministry of Trade, Industry, Regional Integration and Employment (MOTIE). The strategy benefited from the contributions of sector stakeholders and youth associations, who played an important role in the consultative process. This roadmap was designed thanks to the technical assistance of the International Trade Centre (ITC) within the framework the Youth Empowerment Project (YEP) funded by the European Union (EU) Emergency Trust Fund for Africa.

This document reflects the ambitions of the public and private stakeholders who defined the enhancements and future orientations for the sector in view of developing economic opportunities for the youth in the communication and technology sector (ICT).

Note to the reader about the Youth and Trade Roadmap:

The Youth and Trade Roadmap for The Gambia sets out how to realize the full potential of trade for The Gambia's youth. The document will serve as a guiding compass for the government to bolster competitiveness and thereby reduce migration flows.

The principal outputs of the Youth and Trade Roadmap for The Gambia design initiative are four endorsed, coherent and comprehensive documents with five-year detailed plans of action (PoA) and implementation management framework. These documents include:

1. The Youth and Trade Roadmap document, which identifies trade sectors' growth potential and economic opportunities for the youth. The roadmap defines in a comprehensive manner a prioritized development framework at the national level around four pillars: skills development, entrepreneurship and self-employment, market-led value chain development and sector coordination.

2. Three individual sector roadmaps packaged as separate documents in line with the main document's overarching strategic objectives. The priority sectors offering the most promising potential for economic opportunities for the youth are:

- Nuts and agroprocessing
- Information and communications technology (ICT)
- Tourism.

Sector roadmaps present action plans with activities and priorities for building market-oriented skills and fostering value addition that will create employment opportunities and income generation for the youth. Specifically, each sector roadmap provides recommendations on improving productivity and quality, technical and vocational skills, market reach and diversification, and how to facilitate youth entrepreneurship.

The Youth Empowerment Project aims to reduce migration pressures in The Gambia. The four-year project takes a market-led approach and sets out to strengthen existing youth development systems, structures and services to create employment opportunities. It aims to scale up skills among youth in the workforce in response to market demands. The project offers possibilities for youths interested in moving into the commercial agriculture, service business or tourism sectors.

The EU Emergency Trust Fund for Africa addresses the root causes of irregular migration and displaced persons in Africa. More specifically, it helps address the root causes of destabilization, forced displacement and irregular migration by promoting equal opportunities, and strengthening security, development and resilience of vulnerable people.

ITC is the joint agency of the World Trade Organization and the United Nations. ITC helps businesses in developing countries to become more competitive in global markets, speeding economic development and contributing to the achievement of the United Nations Global Goals for sustainable development. As part of the ITC mandate of fostering sustainable development through increased trade opportunities, the Chief Economist and Export Strategy section offers a suite of trade-related strategy solutions to maximize the development pay-offs from trade. ITC-facilitated trade development strategies and roadmaps are oriented to the trade objectives of a country or region and can be tailored to high-level economic goals, specific development targets or particular sectors, allowing policymakers to choose their preferred level of engagement.

The International Trade Centre (ITC)

Street address: ITC, 54-56, rue de Montbrillant, 1202 Geneva, Switzerland

Postal address: ITC Palais des Nations 1211 Geneva, Switzerland

Telephone: + 41-22 730 0111

Email: itcreg@intracen.org

Internet: <http://www.intracen.org>

Layout: Jesús Alés – www.sputnix.es

ACKNOWLEDGMENTS

The Youth and Trade ICT Roadmap was developed under the aegis of the Ministry of Trade, Industry, Regional Integration and Employment (MoTIE) and the Ministry of Youth and Sports (MOYS), with the financial support and technical assistance of the Youth Empowerment Project (YEP).

The document benefited particularly from the inputs and guidance provided by the members of the ICT core team that steered the formulation of the roadmap, namely:

Name	Position	Organization
Core Team Chairperson Ms. Beran Gillen	Vice president	Information Technology Association of The Gambia (ITAG)
Core Team Vice Chairperson Mr. Lamin Jawneh	Founder	Wonma
Core Team Secretary Ms. Amie Njie	ICT Officer	Ministry of Information and Communication Infrastructure (MOICI)
Mr. Hassan Y Jallow	CEO/founder	Assutech
Mr. Kebba Darboe	Staff	GTTI
Mr. Seedy Bensouda	CEO	Insist Global
Mr. Sheikh Tijan Secka	Proprietor	STS Pictures
Mr. Jalamang Jobarteh	Managing director	Nifty ICT Solutions
Mr. Saihou Sillah	Partner	Nucitech
Mr. Bubacarr Barry	Co-founder	Smart Technologies
Ms. Theresa Keita	Programme manager	YMCA Computer Training Centre & Digital Studio (CTC/DS)
Mr. Kebba Sillah	CEO	Sterling Consortium
Mr. Mam Touray	Director	Gambia Technology Management Institute (GTMI)



Photo: ITC

Technical support and guidance from the ITC was rendered through:

Name	Position	Organization
Ms. Marion Jansen	Chief Economist	ITC
Mr. Anton Said	Head Trade Strategy Programme	ITC
Mr. Olivier Marty	Project Leader	ITC
Assisted by:		
Mr. Stéphane Boyera	Senior International Consultant	ITC
Mr. Dejan Dincic	Senior International Consultant	ITC
Ms. Alexandra Golovko	International Consultant	ITC
Ms. Justine Lan	International Consultant	ITC
Mr. Federico Manto	International Consultant	ITC



FOREWORD

ICT CORE TEAM

“ An Opportunity for Innovation and Cross-Sector Synergies for ICT in The Gambia ”

The ICT core team is grateful to be part of the Youth and Trade Roadmap.

The very essence of launching this roadmap as a team that includes stakeholders from youth, public agencies, private businesses and training institutions is a symbol of our capacity to work together and support the future implementation of the roadmap.

This Youth and Trade Roadmap for the ICT sector is part of The Gambia Youth Empowerment Project (YEP), a four-year European Union-funded initiative to build skills, enable value addition and foster market connections.

Our goals and responsibilities are to ensure that the interests of all our members are represented throughout the design and implementation of the roadmap. This is a great opportunity for us to set into action the digital transformation and collaborate with other sectors in creating synergies to enhance business growth and generate high value jobs for the youth.

For this, the Core Team is committed to the successful implementation of the plan of actions to carry the ICT sector forward with the vision and action plan that will develop the start-up and innovation ecosystem through higher-level skills training and e-entrepreneurship to support our goals. The CoreTeam is also committed to collaborate with key partners in ensuring the required ICT standards are developed, implemented and adhered to.

We would like to thank our partners, the International Trade Centre and the European Union, for the support provided at this juncture to help us create and seize these opportunities for our young population.

Sincerely,

Beran Dondéh Gillen
On behalf of the ICT Core Team

CONTENTS

Acknowledgments	iv
EXECUTIVE SUMMARY	1
BACKGROUND	5
ICT IN THE GAMBIA: A SECTOR READY TO SURF ON THE RECENT NETWORK EXPANSION	7
YOUTH ASPIRATION FOR THE ICT SECTOR	7
Youth aspiration in rural areas	7
MAPPING OF ICT SERVICE PROVIDERS AND SERVICE AREAS IN THE GAMBIA	8
SECTOR PERFORMANCE AND INVESTMENT	10
ICT market in The Gambia	10
A competitive mobile and data network, but a limited access to Internet	10
Investment in ICT	15
ICT POLICIES AND RELATED SUPPORT SERVICES	16
Policy framework for ICT	16
Sector support institutions	16
KEY COMPETITIVE CONSTRAINTS IN THE ICT SECTOR	18
Firm level capabilities and competitiveness issues	21
Business ecosystem constraints	22
SKILLS DEVELOPMENT ISSUES, SKILLS GAP ANALYSIS AND TVET MAPPING	25
Availability and quality of labour	25
Skills gap analysis	26
TVET mapping	29
Innovation ecosystems and entrepreneurship support services	34
THE WAY FORWARD: YOUTH EMPLOYMENT OPPORTUNITIES IN ICT	37
THE VISION	37
STRATEGIC OBJECTIVES FOR YOUTH EMPOWERMENT	37
KEY SUCCESS FACTORS	38

LEVERAGING OPPORTUNITIES FOR YOUTH IN THE ICT SECTOR	38
ICT industry perspectives	38
Potential new markets and services areas	40
Market identification and investment attraction	45
SKILLS NEEDED TO SUPPORT SECTOR DEVELOPMENT	46
REINFORCING TVET AND CREATING A TECH HUB TO SUPPORT E-ENTREPRENEURS	48
Upgrade the level of ICT courses offering and build up TVET capacities	48
Create a tech hub to support e-entrepreneurs	51
STRENGTHENING SECTOR COORDINATION AND SUPPORTIVE REGULATIONS	53
ICT YOUTH AND TRADE ROADMAP – PLAN OF ACTION	57

BOXES

Box 1: Snapshot of the surveyed ICT sector sample	19
Box 1: Snapshot of the surveyed ICT sector sample (cont.)	20
Box 2: Examples of apps in agriculture with potential in Africa*	44
Box 3: ICT certifications	48
Box 3: ICT certifications (cont.)	49
Box 4: International Telecommunication Union (ITU) Centres of Excellence	50
Box 5: Hackathon: coding for problem-solving	53

FIGURES

Figure 1: Components of the ICT sector	5
Figure 2: Mobile network customers in The Gambia	11
Figure 3: Map of 3G coverage and all networks in The Gambia	12
Figure 4: Fixed and mobile penetration – The Gambia vs African average	12
Figure 5: Penetration rate of different technologies	13
Figure 6: Percentage of individuals using the Internet in The Gambia	13
Figure 7: Mobile broadband prices in The Gambia	14
Figure 8: Firm level competitiveness scores	21
Figure 9: Business ecosystem competitiveness scores	23
Figure 10: Level of education of employees in the ICT sector	26
Figure 11: Overview of barriers in employing young people by sector	26
Figure 12: Preparedness of staff by level of education	27
Figure 13: Level of competencies – ICT	27
Figure 14: Types of training and mentoring provided	28
Figure 15: Facilitation of mentorship or internship by firms in the ICT sector	29
Figure 16: Tech hubs in Africa	35
Figure 17: Worldwide business spending on ICT by sector (USD billions), 2009	39
Figure 18: Percentage of individuals using the Internet, by region and category	39
Figure 19: Examples of voice-based services	41
Figure 20: Digital marketplace	43
Figure 21: Youth and Trade Roadmap implementation management framework	55
Figure 22: Youth and Trade Roadmap sector core team	56

TABLES

Table 1: Mapping of firms and services in ICT	8
Table 2: Subscriptions by type, 2012–2014	11
Table 3: Trade support institutions in ICT	17
Table 4: SME competitiveness grid	20
Table 5: Main competitiveness issues at the company level	22
Table 6: Main competitiveness issues in the business ecosystem	24
Table 7: University and main TVET institutions in ICT	30
Table 8: New market and product opportunities	46
Table 9: Skills gap assessment in the ICT sector by typical occupation and type of new courses needed	47

ACRONYMS

ACE	Africa Coast to Europe	MSMEs	Micro, small and medium-sized enterprises
BPO	Business process outsourcing	NAQAA	National Accreditation and Quality Assurance Authority
CoE	Centres of Excellence	NGO	Non-governmental organization
FDI	Foreign direct investment	PURA	Public Utilities Regulatory Authority
GIEPA	Gambia Investment and Export Promotion Agency	QIT	QuantumNet Institute of Technology
GSM	Global System for Mobile Communications	R&D	Research and development
GSQF	Gambia Skills Qualifications Framework	SME	Small and medium-sized enterprises
GTTI	Gambia Technical Training Institute	SMECS	SME Competitiveness Survey
ICT	Information and communication technologies	SMS	Short message service
ICTS	Information and communication technology services	TVET	Technical and Vocational Education and Training
IoT	Internet of Things	UNCTAD	United Nations Conference on Trade and Development
ISP	Internet service provider	UTG	University of The Gambia
ITAG	Information Technology Association of The Gambia	YEP	Youth Empowerment Project
ITC	International Trade Centre	YMCA	Young Men's Christian Association
MDI	Management Development Institute		
MOICI	Ministry of Information and Communication Infrastructure		



EXECUTIVE SUMMARY

The Gambian ICT sector has undergone a profound mutation and expansion phase. That progression from a very low base was enabled through liberalization and privatization policies led by the government, as well as the connection with the Africa Coast to Europe (ACE) submarine cable, speeding up Internet access to The Gambian population. In the past years, a small number of companies providing ICT-related services mostly in telecommunications bloomed in the newly created market. Compared to the rest of the continent, The Gambia is thus well positioned in terms of infrastructure, mobile network coverage and mobile penetration. All the conditions for a vibrant ICT ecosystem are, therefore, present. However, due to a lack of appropriate vision, policy and strategy to develop the sector, The Gambia has missed the mobile value-added service innovation revolution that has already started in many African countries. Despite the good infrastructure, the start-up and innovation ecosystem in the country is rather weak with, for instance, no active tech hub. In the same way, the lack of focus on ICT as a development driver has limited the understanding of the potential of ICT solutions among actors and education has only been focusing on basic digital skills.

The new government has integrated ICT as part of its priority sector within the new Development Plan to remedy this situation and to ensure positive spillover effects across the economy. To be able to achieve the next development milestone, The Gambia's ICT sector needs to be managed and nurtured. Proper regulations need to accompany entrepreneurship and innovation, the sector coordination must improve, higher-level IT skills have to be developed and quality of the services has to be standardized to ensure sustainable growth. This will allow the sector to truly become the youth employment generator that it is in many countries and provide young people with the high-value jobs they require.

This roadmap initiative has helped to mobilize young entrepreneurs and public actors and revive a dialogue to discuss issues and identify economic opportunities for the youth. In summary, this document aims to serve three purposes: firstly, present the status of the sector and its challenges; secondly, inform stakeholders of the existing skills gaps and training institution deficit in ICT to develop higher technical competencies; and thirdly, provide a realistic roadmap and a plan of action (PoA) geared at achieving the following overall vision:

“ Enhancing business growth with information technology and youth innovation. ”

To achieve this vision, the roadmap focuses on four strategic objectives.

1. Strengthen sector coordination and regulations

The ICT stakeholders have to start working together and establish an ICT board to oversee the sector development, need of policy changes and investment in ICT infrastructure as well as fostering a clustering business culture. The Gambia needs to use ICT as one of its major development pillars. The relatively limited size of The Gambian market requires the actors to learn to set up a consortium to complement their offerings and provide comprehensive solutions, especially in the case of public tenders. The ICT sector association's capacities have to be further developed so the ICT young business community can advocate the required policy changes and regulations alignment to stimulate the sector's growth. In a first step, the roadmap recommends carrying out a national digital audit, in terms of public sector needs and legislation focusing on intellectual property protection, mobile banking and consumer law on mobile data. The next step is for The Gambia to design an e-governance development plan.

2. Improve the quality and relevance of ICT skills development programmes

The Gambia's ICT sector faces serious issues concerning its skills development capacities with limited range and scale of the offer for ICT-related training and education. The major gaps exist in the lack of a structured curriculum oriented in progressive skills development, absence of training in latest technologies (Internet of Things or open data) and limited improvements in monitoring and impact assessment through tracer studies. This roadmap provides the foundations to improve the quality and relevance of the skills development programmes offered by education providers in ICT. The plan focuses on developing new progressive ICT skills standards and a common curriculum among training providers. Sector-wide quality insurance mechanisms will certify training providers and their courses while improving impact assessment through tracer studies. University and training providers will be supported to develop new programmes at all education levels focusing on multimedia, application development and database management. Teachers' technical capacities will be strengthened through academic exchanges, increased linkages with the ICT business community and development of an entrepreneurial and frugal innovation mindset supported by the establishment of an ICT research centre focusing on Jugaad innovation in ICT.

3. Improve micro, small and medium-sized enterprise productive capacities and market linkages

Productive capacities in ICT are driven by the skills available in the country, the innovative mindset of entrepreneurs and capacities to participate in collaborative ventures. The three are currently in limited supply in The Gambia. Thus, the driver of the sector's future growth in The Gambia is highly dependent on the creation of a strong market pull orchestrated by the public sector, given the existence of a wide need for digitization in public services and infrastructure. For this, the roadmap sets forward the design of a digitization strategy for public agencies and the development of an ICT consortium to carry out the implementation plan. MSME's capacities to participate in this new market can only be strengthened by focusing on innovation and synergies. The twofold plan includes on one side the creation of a tech hub, a shared space providing business support services and connectivity to starts-ups and young developers, to facilitate collaboration and joint business development. On the other side, the development of a tech park, a special zone combining physical and legislative backstopping for larger firms to develop their services, attract investors and develop partnership with multinationals operating in West Africa.

The roadmap also recommends the facilitation of cross-sector synergies to develop new ICT-enabled services and products, and stimulating the demand of the public and private sectors on immediate needs through the organization of hackathons and ICT demonstration days. In parallel, ICT employees need to improve their technical capacity to accompany the change. On-the-job training programmes will be conducted to upgrade their competencies.

4. Foster e-entrepreneurship and business growth

Entrepreneurship education appears to be quite limited among training institutions providing ICT-related courses. Less than half of them integrate at least some form of entrepreneurship training as part of their curriculum. Just as the roadmap aims at fostering collaboration and reducing the skills gap, it will also supplement existing entrepreneurship and business growth support programmes with technical expertise, develop access to innovative financial schemes and build linkages with the diaspora to develop education sponsoring and investment. Simultaneously, actions are included to build the ICT capacities of youth centres in rural districts to improve basic digital skills and kick-start the development of ICT-enabled services in remote areas.

Promising untapped domestic opportunities to be developed through digitalization of public services and cross-sector synergies in agriculture, education, tourism, finance and health:

The Gambia is well positioned in terms of infrastructure, mobile network coverage and mobile penetration. All the conditions for a vibrant ICT ecosystem are, therefore, present. However, due to a lack of appropriate vision, policy and strategy to develop the sector, The Gambia has missed the mobile value-added service innovation revolution that has already started in many African countries. The roadmap proposes to capture those untapped opportunities by developing new services areas that entail important demand for digitalization and will create jobs for the youth.

Potential linkages have been identified in the course of the roadmap design process in the context of agriculture, tourism and education. Various shortfalls in these sectors could be addressed through ICT solutions. For instance, the development of mobile apps and voice-based services to facilitate market information flows between agriculture value chain actors or improving web marketing of local tourism operators to target new clientele. The roadmap also proposes to develop microwork initiatives through public-private partnerships, for instance, to digitize archives of public institutions. This model has been successful in other countries as a way to train youth in ICT, support the government and initiate business process outsourcing (BPO) activities locally with the aim to expand outside the country later. Additionally, this roadmap envisions the creation of a long-term e-government initiative supporting the development of an e-commerce ecosystem and digital payment infrastructure to develop online transactions and online working with foreign markets.

Achieving this roadmap's objectives requires a focused and coordinated effort around the detailed plan of action (PoA) that specifies a series of activities to be implemented during a five-year period. A great deal of consultation among public and private sector stakeholders has taken place to identify these priority actions. This is visible through the dialogue platform and the sector's core team that has been established. This collaboration among policy makers, technical agencies, young entrepreneurs, training institutions and development partners must continue during the implementation phase of the roadmap to ensure effectiveness and maximum impact. The implementation framework defines systematic management, monitoring and measurement mechanisms that are complementary to those identified in the National Development Plan. The establishment of this framework will determine the degree of success of this roadmap.

Implementation of this roadmap will not only bring stakeholders together to cooperate in setting a new development path for the sector, it will also provide economic opportunities for the young ICT business community and its entrepreneurs to contribute to the country's economic development.



BACKGROUND

In The Gambia, the services sector is the largest contributor to gross domestic product (GDP) (64% in 2015¹) and continues to grow. This predominance of the services sector is not a common economic structure in least developed countries (LDCs), which often mostly rely on agriculture. This dominance of the services sector could at first appear to be a positive sign, as services usually indicate a more advanced economy. However, The Gambia's services sector shows a very low sophistication. The services sector is comprised of low-value, informal and distributive trade with low-skilled workers and low-paying jobs. Usually, the drivers for services development and sophistication in a country are agriculture and industry, as they generate various trade and business services required to support them. However, the relatively low development of agriculture and especially manufacturing in The Gambia fails to push the sophistication of the services sector. The current economic structure calls for a reinforcement of the productive sectors together with the prioritization of highly productive services such as information and communication technologies (ICT) to ensure that the employment opportunities created are high paying and focus on the young population.²

ICT is renowned to be a dynamic and rapidly evolving sector. The sector encompasses Internet access technologies and the content it enables (software, cloud storage systems, data, economic transaction systems and artificial intelligence (AI), etc.), as well as wireless mobile networks. Computer and mobile-related hardware is another important segment of the sector. In parallel with these innovation-driving fields, the communication side still includes less recent technologies like landline telephones, radio and television. The list of ICT subsectors, however, continues to evolve day by day, specifically in the fields of smart devices, AI and robotics.

However, only a portion of the ICT spectrum is present in The Gambia. It is mostly comprised of Internet and mobile connectivity firms, a few software engineering firms, hardware retailers and a few basic computer-training providers. That said, the sector presents signs of a strong pick-up over the past few years, with a multiplication of small and medium-sized enterprises (SMEs) in the sector engaging in new ICT sub-segments. Total employment in the ICT sector stood at 2,529 in 2012 according to the International Labour Organization's (ILO) latest Labour Force Survey. This number could grow further and particularly employ young populations. Awareness of new technologies is especially

strong among young people and they are the main targeted workforce by the sector. The World Bank's recent report on digital dividends shows that Internet penetration is much stronger for youth compared to the mature population.³

In The Gambia, demographic structure is dominated by youth – 72% of the population is under the age of 29.⁴ For youth, access to information and faster means of communication translates into better access to capital, markets and training, increased participation in political processes and youth prominence on a global scale. Access to technology ultimately facilitates youth entrepreneurship, pioneering the use of ICT.

This roadmap's key focus will be to equip Gambian youth with the right skills to take advantage of the opportunities the digital world offers and turn them into economic benefits. The world is more interconnected than ever before. ICT literacy not only qualifies young people for jobs in conventional sectors, but also opens the door for them to participate in rapidly growing markets like business process outsourcing (BPO), app development, social media and other technologically driven areas.⁵

Figure 1: Components of the ICT sector



1.– World Development Indicators, 2017.

2.– The Gambia, National Human Development Report, Youth Employment, United Nations Development Programme (UNDP), 2014.

3.– <http://documents.worldbank.org/curated/en/896971468194972881/pdf/102725-PUB-Replacement-PUBLIC.pdf>.

4.– ILO, Labour Force Survey, 2012.

5.– <https://www.cia.gov/library/publications/the-world-factbook/geos/ga.html>.

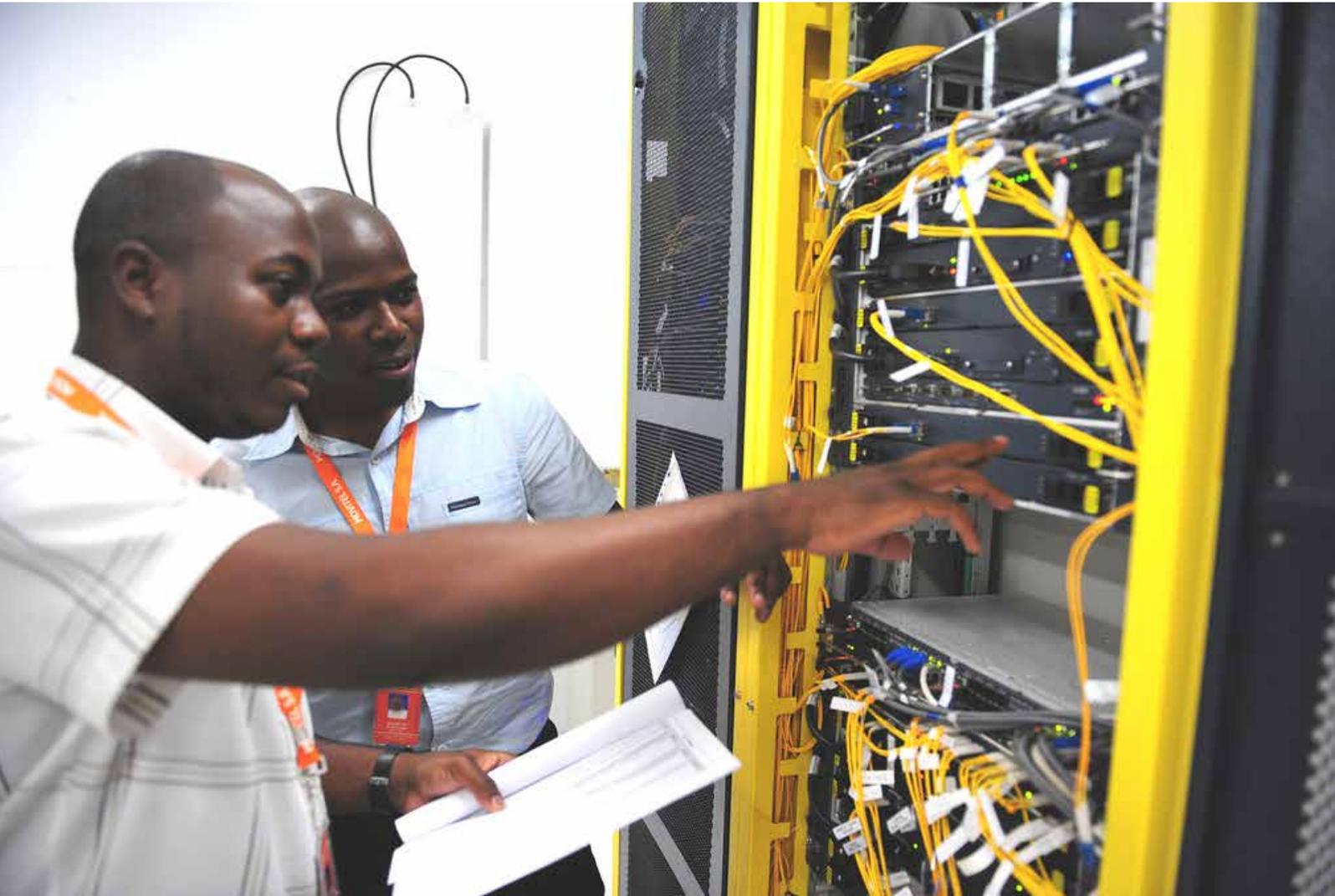


Photo: c1.staticflickr.com/

ICT IN THE GAMBIA: A SECTOR READY TO SURF ON THE RECENT NETWORK EXPANSION

YOUTH ASPIRATION FOR THE ICT SECTOR

Throughout the sector consultations, field visits and interviews, ITC experts have tried to assess the general aspiration of youth toward the ICT sector.

From the interviews of youth organizations and individuals, a few key findings have emerged. The first one is the general interest in technologies, mobile and ICT in particular. Almost all young people are perfectly fluent with mobile phones, most of them with social media like Facebook (220,000 users in June 2017, equivalent to 50% of the total number of Internet users in the country) and other social media (WhatsApp was unblocked after the last election). Most of them are also fluent with Internet access and computer (e.g. e-mail). They are also interested in other topics such as networking or software development.

Compared to other sectors, there is greater interest in entrepreneurship among youth in ICT. One of the potential reasons is the level of salary provided by ICT jobs. Most interviewed ICT and telecommunication companies usually pay their staff in the GMD 3,000–GMD 5,000 range (\$60–\$100) per month. These very low salaries lead to a high turnover that companies highlighted as a challenge. The main complaint is that the company trains young people without useful skills, and then, when they have the skills, they leave for a better salary. On the other hand, the salary expectation that emerged from interviews seems very reasonable, in the range of GMS 15,000–GMS 25,000 monthly (\$300–\$500). This is far lower than in the Republic of Senegal, where a software developer can easily get \$1,000 per month.

YOUTH ASPIRATION IN RURAL AREAS

During the visits to the regions, it became clear that the ICT landscape in rural areas is slightly different from in the greater Banjul area and should be reported separately. In terms of commonalities, the interest and excitement of young people about mobile technologies and ICT is as developed as in the western region and the capital. However, the awareness of the opportunities – the type of jobs that are available, the



Photo: ITC

topics such as networking and graphic design, etc. – is far lower. Most of them have heard about these topics, but have no real clue about the content and opportunities. This is also largely due to very limited infrastructure such as Internet cafés, ICT centres and ICT training activities available in the regions. The main issue is related to electricity (absence and instability), which makes the operating of ICT centres almost impossible. One of the biggest regions, Central River Region (CRR), and its main part, CRR North, does not have even a single ICT centre. The absence of such infrastructure impacts largely on awareness and skills development.

At the same time, the use of IT and ICT is also far lower than in the capital. Very few businesses have computers and even fewer have an Internet connection. The demand of ICT services and ICT skills is very low, if not inexistent. At first glance, and in the short term, the ground does not seem to be very fertile for the development of the ICT market in the rural areas unless it is limited to specific services such as printing, photocopying, document editing and formatting. As a first step, an awareness campaign about ICT opportunities could be a way to create an agent of change.

MAPPING OF ICT SERVICE PROVIDERS AND SERVICE AREAS IN THE GAMBIA

In 2017, there were more than 40 registered firms operating in the area of ICT in The Gambia, up from 24 in 2014. Their areas of activity and provided goods and services are summarized in Table 1.

Table 1: Mapping of firms and services in ICT

	Company	Leading products and services	Markets	Significance to the sector
Internet access and related services	Gamtel	Web hosting, 3G, dial-up services, lease line, telephone line, Internet service provider (ISP), ISDN, virtual private network, e-banking, additional ventures planned in e-learning, e-commerce and e-health	Gambia	
	Gamcell	Prepaid/post-paid services, Internet and data services, roaming facilities, Kafo (closed user group), Njukal (loyalty scheme) and conference calls	Gambia	
	Unique Solutions	Internet services, networking, software advisory, mobile phone repairs training, virtual private networks, security solutions, technology integration and system set-up	Gambia	RLG sister company
	Smiling Coast Media Limited	Multimedia, advertising and branding	Gambia	
	Lanix	Offering training to individuals on CISCO networking, cybersecurity and IC3 digital literacy		
	Netpage	LTE broadband service, ISP, local and wide area networking, local wireless connectivity, web design and website hosting, corporate training and IT security consultation	The Gambia, serving government, non-governmental organizations (NGOs), embassies and individuals	First to launch 4G, now 4G LTE
	I-Link	Internet café, computer repairs, computer equipment and accessories		
	NICE Gambia	Internet services, education (IT and business courses), business hub, outsourcing, IT and energy products distribution		
	Web design Gambia	Web design, logo design, graphic design, hosting solutions, e-mail solutions and SEO services		
	ITG Security	Internet security solutions		
	QCell	3G + network, USB data card and Qodoo Mobile Money		
	InSIST Net	ISP	The Gambia, serving homes, companies and schools	Employs 10+
	Standard Newspaper / Nucitech /	Company branding, digital marketing and graphic designing		
	Africell	ISP	Gambian headquarters, with subsidiaries in the Democratic Republic of the Congo, the Republic of Sierra Leone and the Republic of Uganda	Country's largest mobile Internet provider
	QuantumNet	ISP	The Gambia, Sierra Leone	Employs 300. Country's first ISP. Sister company of Qcell.

	Company	Leading products and services	Markets	Significance to the sector	
Software development	InSIST Global	IT consulting services, software development for education, health, and enterprise resource planning	The Gambia, Senegal	Employs 20	
	Lasting Solutions	Software development, IT training, computer and sales services, networking, IT consulting and PC repairs			
	Assutech	Mobile apps, website design, desktop apps and web apps			
	KMF Technologies	Network design, software customization, hardware sales and hardware repairs	The Gambia, serving government, including the Central Bank of The Gambia and the port authority		
Communication	African Coast to Europe (ACE)	Telecom infrastructure			
	DSTV/Premium TV Network	Digital satellite TV service			
	GamTV	Subscription-based satellite TV station rebroadcasting service			
	Paradise FM and 19 other radio stations	Radio stations			
	Doorstep Express (DEX)	Local express delivery			
	Mobile phone operators				
	Africell	Prepaid and post-paid mobile telephony	Gambian headquarters with subsidiaries in the Democratic Republic of the Congo, Sierra Leone and Uganda	Largest mobile phone company in the country	
	Comium	Integrated mobile and telecommunication services comprising post-paid and prepaid communications, value-added services and short message service (SMS)	The Republic of Côte d'Ivoire, The Gambia, the Republic of Liberia and Sierra Leone		
	Gamcel		The Gambia	Subsidiary of Gamtel	
	QCell	Mobile voice calls, video calls and 3G/EDGE Internet access	The Gambia, serving government, NGOs, embassies and individuals		
	Fixed-line phone operator				
	Gamtel (SOE)	ISDN, VPN, ISP and e-banking, with other ventures planned in electronic learning, commerce and health	The Gambia	Shareholder in the ACE submarine cable	
	Hardware	Shyben A. Madi & Sons	Office and IT equipment (Xerox; Riso)		
FuturTech Ltd		Software and hardware installations, web development, printing services, network design and implementation, and biometric solutions			
Nifty ICT solutions		Software and hardware installation, hardware retail, training and repair			
Naila Huda Technology		Phones and accessories, selling music, and sales of DVDs and CDs			
Abraxas QuantumNet		Electronic goods, motor vehicles and services			
Link Up Sound		Selling and repairing laptops			
RLG Gambia Company Limited		Mobile phone assembly, software installation and testing	The Gambia, Senegal	Trains local technicians in mobile phone repair. Unique Solutions sister company.	
Transactions	Farm Fresh	E-commerce: online grocery shopping and delivery	The Gambia and the diaspora		
	BuySell	E-commerce: online bidding on (mostly used) goods for sale	The Gambia		

Source: The Gambia Public Utilities Regulatory Authority (PURA), 2014 and Gambia.com online company registry and prominent ITC companies in The Gambia from Investment Policy Review, United Nations Conference on Trade and Development (UNCTAD), 2017.

SECTOR PERFORMANCE AND INVESTMENT

This section will present the current status of The Gambia's ICT sector, which areas and services it encompasses, the main actors, the sector's performance, its market orientations and global context. Even though the ICT sector in The Gambia is not yet focused on exports, it is important to assess it in the context of the subregional and international market dynamism.

ICT MARKET IN THE GAMBIA

The sector is concentrated on the domestic market and has not achieved the required critical mass allowing it to export its services (other than mobile tour operators). The domestic market segments are mostly articulated around the consumer market and private sector operators to a lesser extent. The public services are still a marginal segment of the domestic market and there is scope to strengthen this share.

The domestic market is in the process of increasing for a broader range of ICT subsectors as Internet and mobile network coverage are growing. This creates the possibility for the sector to diversify in new and untapped areas, leveraging the broader public access to the Internet and the multiplicity of services it makes available to the population.

A COMPETITIVE MOBILE AND DATA NETWORK, BUT A LIMITED ACCESS TO INTERNET

At a glance, it is visible that the ICT sector in The Gambia is mostly concentrated on Internet access and related services. The multiplication of companies in this area is a fairly recent development, as initially The Gambia Telecommunications Company Limited (Gamtel) was the sole Internet service provider (ISP). Following important reforms to liberalize the sector, it is flourishing, with many service providers and strong competition. Thanks to this large number of Internet service providers and cyber cafés, Internet use has been on the increase in the country. However, the population mostly uses mobile phones to access the Internet (1.9% of users had a subscription to fixed-line Internet in 2016, while the rate of mobile-cellular subscriptions was 139.6%⁶).

There are four mobile operators present in the country. The government's liberalization and privatization policies fostered the arrival of these new operators. Gamtel is one

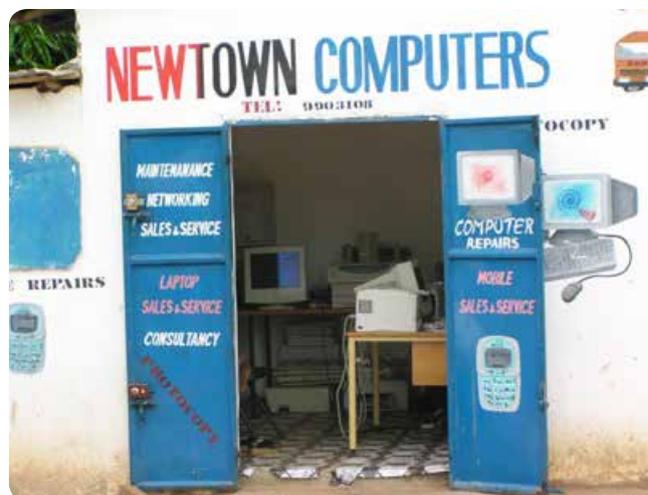


Photo: (CC BY 2.0) Nichol Brummer

of the shareholders in the fibre-optic cable established in 2012 that runs across the country and controls its connection to the Internet through the Africa Coast to Europe (ACE) submarine cable system. Since May 2013, private telecom operators are allowed to lease access to the gateway for data services. The first Internet exchange point (IXP) was also launched in 2014 to increase speed, security and affordability of Internet access.

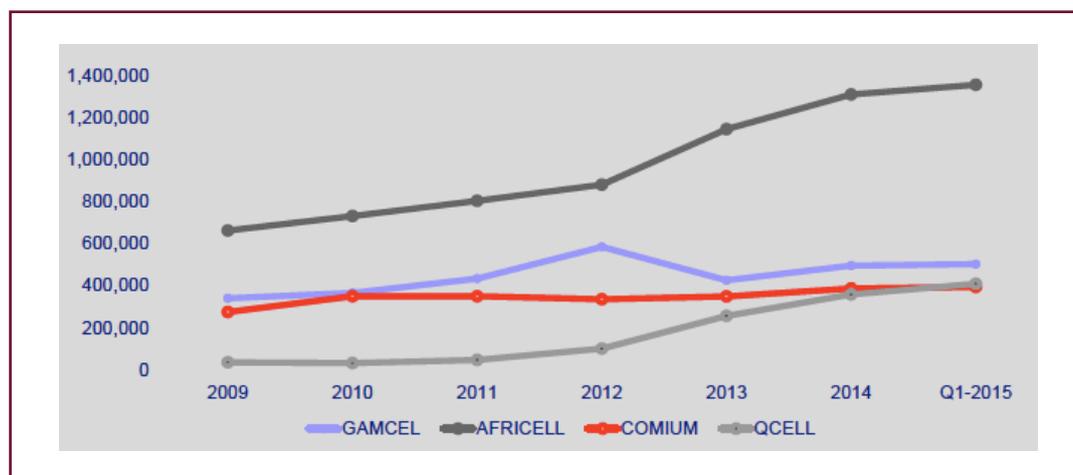
Among the four mobile network providers, Africell is by far the leading firm, with approximately 1.4 million subscribers in 2014, followed by the public firm Gamcell. Comium (Luxembourg) and Qcell (The Gambia) are increasing their quota of the market, increasing the sector's competitiveness. Comium's presence is a positive signal of an increased attractiveness of the market after the liberalization, as more foreign companies are coming into The Gambia to invest and support the sector's development. The Public Utilities Regulatory Authority (PURA) confirmed the good status of the market's health, registering a steady growth of mobile phone and Internet subscriptions between 2012 and 2014, with respectively +12% and +34% compound annual growth rate (CAGR) between these years (see table 2).

The market dynamics also indicate that mobile and Internet subscriptions are progressively replacing fixed lines, as there is a net decrease in fixed-line subscriptions registered between 2012 and 2014. This drop appears to continue beyond this period, as Gamtel reports further decline in its revenues in 2016.⁷ This provides a clear indication of the market trends in the country. Most of upcoming sector diversification potential lies in mobile-based Internet services and technologies.

6. – <https://www.itu.int/net4/itu-d/icteye/CountryProfileReport.aspx?countryID=92> (ITU).

7. – Ibid.

Figure 2: Mobile network customers in The Gambia



Source: PURA, 2014.

Table 2: Subscriptions by type, 2012–2014

	2012	2013	2014	CAGR	Annual growth in value between 2013 and 2014 (% p.a.)
Fixed line subscriptions	64 196	50 334	47 540	-9.5%	-5.6%
Mobile subscriptions	1 526 181	1 986 490	2 159 099	12.3%	8.7%
Fixed Internet subscriptions	3 112	2 501	3 200	0.9%	27.9%
Mobile Internet subscriptions	127 809	157 488	308 393	34.1%	95.8%

Source: PURA, 2014.

The country has a well-developed GSM and data network coverage, with four mobile operators and five ISPs (PURA, 2015⁸), allowing 96% of the population to be covered by a GSM signal and 86% by a data network, The details by operator are provided in the table below.

Operator	Population coverage
Gamcel	78%
Comium	66%
Qcell	82%
Africell	91%

Source: PURA 2015.

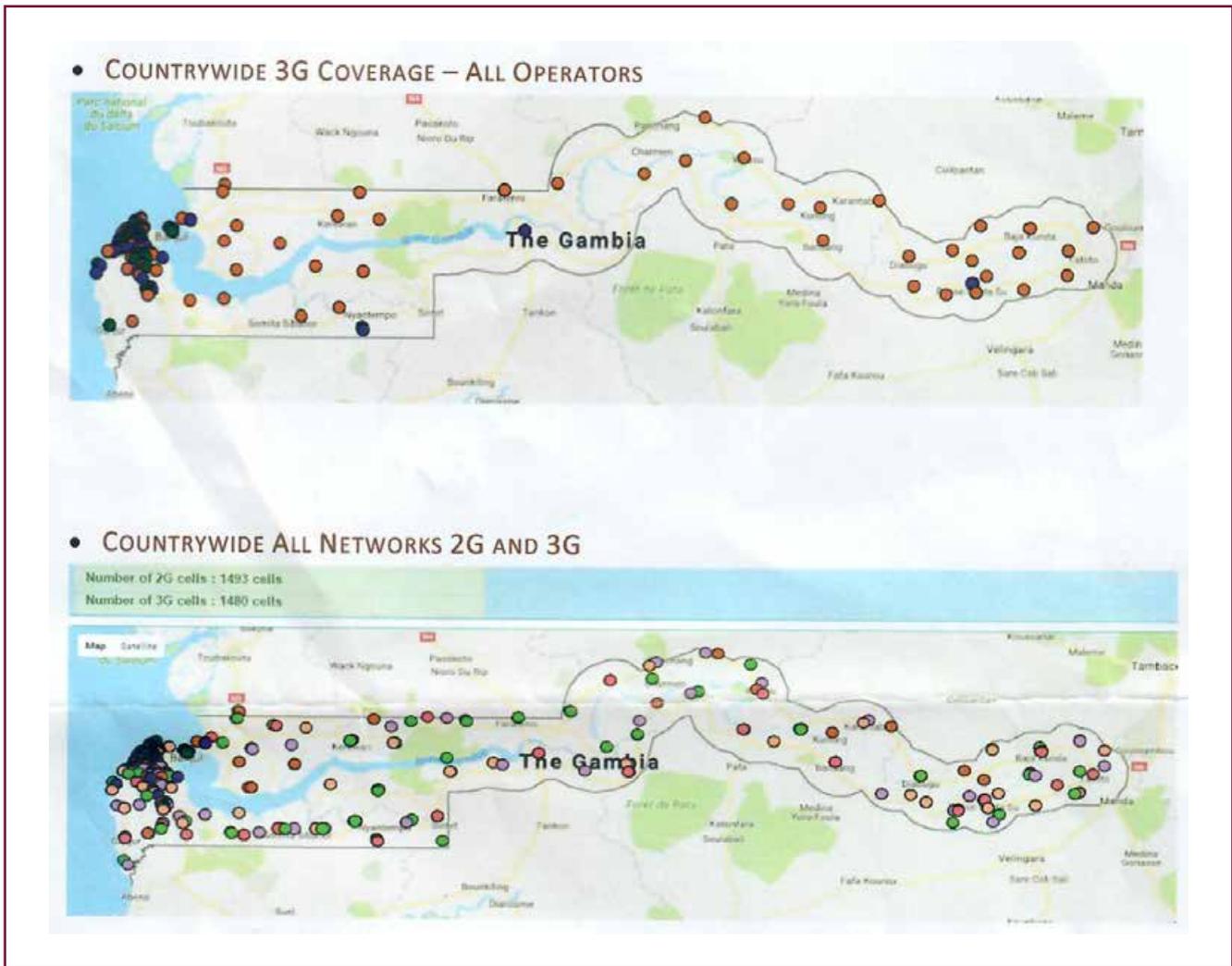
In terms of data network, the maps in figure 3 detail the coverage by operator. It is no surprise that the coverage is very dense in the highest population density in the West Coast District and Kanifing Municipal Council (KMC). Notice too that a 3G network also covers rural districts.



Photo: (cc) wikimedia commons

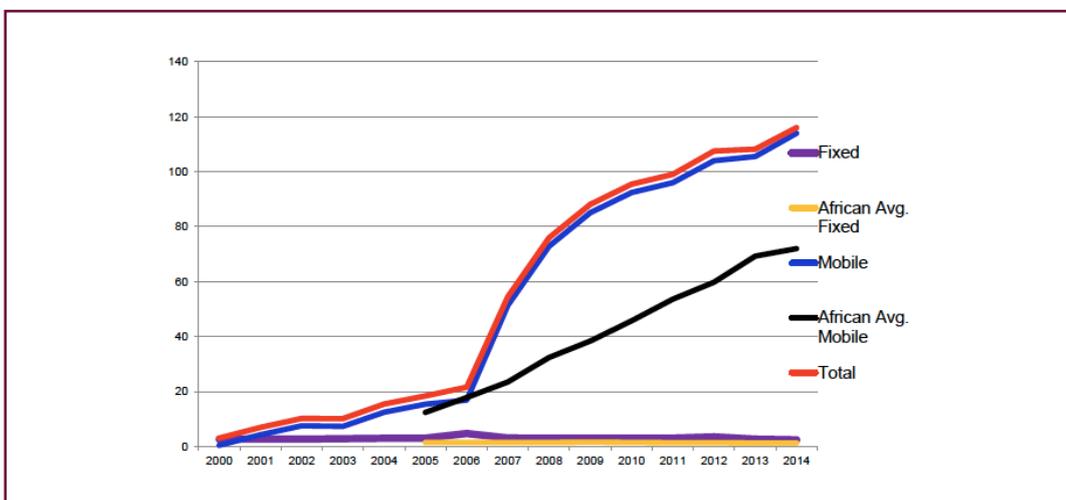
8.– https://www.itu.int/en/ITU-D/Statistics/Documents/events/ethiopia2015/5-Gambia_ICT_data_collection.pdf.

Figure 3: Map of 3G coverage and all networks in The Gambia



Source: Public Utilities Regulatory Authority (PURA) – Performance overview of mobile operators in The Gambia.

Figure 4: Fixed and mobile penetration – The Gambia vs African average



Source: PURA, 2014.

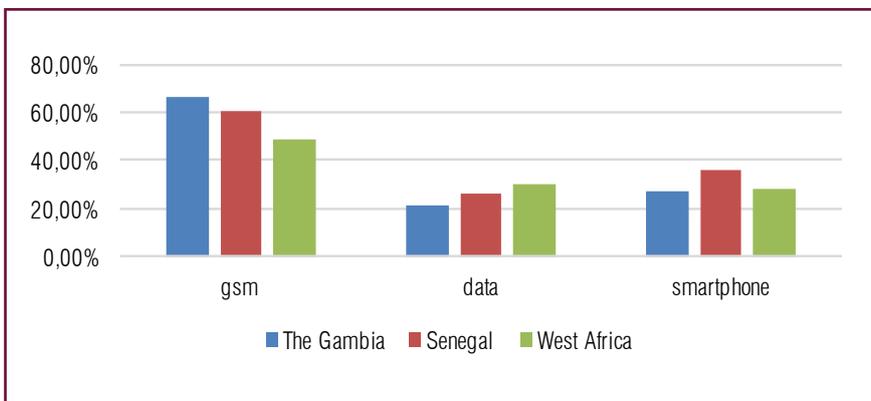
The country benefits from one of the highest mobile phone penetration rates on the continent, with a value of 137.8% in 2015.⁹ This good performance is shown in figure 4.

The country has a good GSM coverage but a low penetration rate in data subscribers. In comparison, 92% of Senegal's population is covered by a GSM network and only 50% by a data network. A similar difference exists

concerning mobile subscription. The Gambia, with 1.4 million unique GSM subscribers, has a penetration rate of 66.6%, which is the second-highest in West Africa after the Republic of Ghana (66.7%) and far ahead of Senegal (60.5%) and the Federal Republic of Nigeria (45.4%). The average penetration rate in West Africa is 53%. However, the situation is different when we look at the number of data subscribers, where The Gambia's penetration rate (21.3%) is behind Senegal (26%). In the same way, the penetration rate of smartphones is 27.5% compared to 35.6% in Senegal (see figure 5).

9.– Ibid.

Figure 5: Penetration rate of different technologies



Source: International Telecommunication Union (ITU) – <http://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017.aspx>.

The country has a limited number of Internet users. Figure 6 shows the number of Internet users in The Gambia, Senegal and the Republic of Côte d'Ivoire from 2000 to 2014. Until 2012, The Gambia and Senegal had similar evolution, but

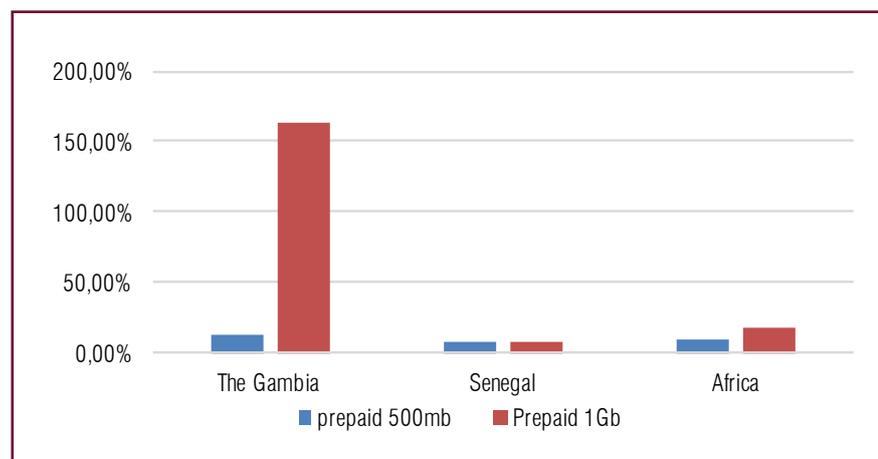
since then The Gambia is underperforming. Even latecomers like Cote d'Ivoire, which had a far slower uptake, have a greater number of Internet users. One possible explanation is the affordability of mobile broadband.

Figure 6: Percentage of individuals using the Internet in The Gambia



Source: International Telecommunication Union – last updated 16 May 2017.

Figure 7: Mobile broadband prices in The Gambia



Source: ITC field research – January 2018.

Expensive data plans limit usage penetration. Figure 7 shows the prices in terms of percentage of gross national income (GNI) per capita. While The Gambia offers 500 MB prepaid data plan at a price that is more expensive, but in the same order of Senegal or the rest of Africa, the 1 GB plan is almost 10 times more expensive than the average.

In terms of ICT services, many organizations and companies are investing in websites, graphic design and multimedia production, but the focus is mostly on communication and marketing. Except for internal IT and software, other services are not considered as operational tools or company-internal tools. There is a very limited number of organizations using mobile tools in their operation (e.g. for field data collection and outreaching to their targets, etc.), even if some are more advanced (e.g. United Purpose has multiple mobile services) and could serve as use-cases or examples in the future. More generally, there is a very limited awareness and understanding of the potential of ICT tools to support and improve operations and impact. Consequently, people interviewed do not see the value proposition and, therefore, do not consider investment in ICT as a priority.

In terms of public agencies, the Government of The Gambia is clearly less developed than its neighbours are in terms of use of ICT or e-government and online services. However, the government has indicated new plans to develop an e-government framework in the next few years. Such initiatives will create opportunities for ICT profiles (on the high-end range, e.g. for advanced profile in software development, database administration, web services and alike) in the near future.

E-commerce has significant development potential, but is hindered by the lack of digital payment instruments. E-commerce is an area where The Gambian Government particularly wants the country to develop. The Ministry of

Information and Communication Infrastructure (MOICI) formulated the National Information Communication Infrastructure (NICI) policy strategies and plans, which seek to promote and implement e-commerce in The Gambia, among other things.¹⁰ The Gambia and other relevant stakeholders are also in the process of establishing the Gamswitch Company Ltd, which intends to establish a fully integrated national electronic payment system across all sectors for the facilitation of e-commerce. Several Gambians, based outside the country (principally in the United States of America), have begun setting up online services that sell goods to Gambians. Two companies are already active in the sector.

- **Farm Fresh** is one of the most important companies working in this sector. It provides online grocery shopping and delivery services to The Gambia and the diaspora, supporting the export of local companies through the Internet.
- **BuySell** is also active in the sector, offering an online bidding service on goods for sale, focusing mostly on used goods.

The two companies are the pioneers in e-commerce that have the potential to represent a steady pillar for the country's exports, to neighbouring countries and to The Gambian diaspora. However, given the very low financial inclusion level in The Gambia (75% of the adult population in the country do not have bank accounts¹¹), the development of e-commerce is very likely going to be hindered by the lack of digital payment instruments.

10. – <https://www.export.gov/article?id=Gambia-eCommerce>.

11. – <http://standard.gm/site/2016/04/13/financial-inclusion-key-policy-agenda-government-cbg-boss/>

The most recent developments in 2016 in the ICT value chain include:

- Qcell's launch of the Qodoo Mobile Money service;
- Netpage's launch of The Gambia's first commercial LTE-based broadband service;
- International Network Management Center (IINMC) opened, facilitating traffic on the ACE cable;
- Africell contracted Alepo for data solutions;
- Gamtel contracted Huawei for fibre backbone project;¹²
- Mobile money arrived in 2016, making The Gambia the last market in Africa to get a mobile money service (see study on mobile money¹³ done by the company GSMA).

INVESTMENT IN ICT

As stated earlier, ICT is one of the strongest sectors in The Gambia. Between 2004 and 2013, the foreign direct investment (FDI) flows in ICT increased by more than 60%.¹⁴ Local investment also increased, as in the case of QuantumNet, the country's first Internet service provider, which started as a small enterprise offering computer training services and has since become the largest technology institute in the country. Investors' confidence in the sector is confirmed by their long-term investments: a consortium of 16 international operators invested \$700 million to bring the high-speed Africa Coast to Europe submarine cable from Europe to 23 African countries.

On the other side, the liberalization of the sector through the Information and Communications Act allowed the development of a dynamic and competitive market. Four mobile

12.– Gambia – Telecoms, Mobile, Broadband and Digital Media – Statistics and Analyses, accessed 5 May 2017: <https://www.budde.com.au/Research/Gambia-Telecoms-Mobile-Broadband-and-Digital-Media-Statistics-and-Analyses>.

13.– https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/03/GSMA_State-of-the-Industry-Report-on-Mobile-Money_2016.pdf.

14.– http://unctad.org/en/PublicationsLibrary/diaepcb2017d5_en.pdf.



Photo: 16mhpx3atvadnrnip2kwi9or-wpengine.netdna-ssl.com

operators are active at the moment in the country, and a 5th is set to begin its activities soon.

Due to the market's small dimensions, many providers are exporting services to or have subsidiaries operating in one or more foreign countries, including the Republic of Benin, the Democratic Republic of Congo, Cote d'Ivoire, the Republic of Guinea-Bissau, the Republic of Liberia, Senegal, the Republic of Sierra Leone and the Republic of Uganda.

Investments can play a key role in improving ICT infrastructure. Even if the level of infrastructure development in The Gambia is almost the same of other low-income countries, further improvements are necessary to expand the range of services offered. The expansion of the fibre cables and the development of a data centre and cloud computing are essential for ICT's future. Many public-private partnerships (PPPs) have been activated to support the country and the government is active to find new ones.

The ICT sector in The Gambia has grown from a very low base in the past 10 years due to the liberalization of the access to the ACE submarine cable system. Even if the sector remains marginal compared to the country's major economic drivers, such as agriculture and tourism, it has great potential to grow, since the minimal medium to access the national market – mobile Internet access – is now widely available.

However, the outsourcing of operations by some of the major ICT companies represents a growing threat that could limit the sector's potential to generate employment, especially for youth.

It is essential that relevant skills are present nationally in order for companies to avoid outsourcing their operations. Mitigating the urban-rural skills divide would also be crucial to ensure benefits are not only felt in the Banjul and Kanifing areas.

ICT POLICIES AND RELATED SUPPORT SERVICES

POLICY FRAMEWORK FOR ICT

The policy framework is of particular importance for the development of the ICT sector. The government has streamlined ICT development in its development blueprints, namely Vision 2020, National Export Strategy, the new National Development Plan and The Gambian ICT4D-2012 Plan 2008. The ICT sectors opened for investment are listed on The Gambia Investment and Export Promotion Agency (GIEPA) website, giving a clear sign of this sector's priority in the national investment promotion strategy.

A new National Development Plan (NDP) 2018–2021 was launched in February 2018 with a clear focus on youth development and ICT. The plan will be realized through eight strategic priorities with a clear importance given to youth and defined ICT as one of the critical enablers for economic growth. The government goal is to enhance ICT infrastructure and services for increased access to quality broadband services and solutions to support inclusive sustainable development. Some of the key areas prioritized are improving the regulatory services and policies, creating a national ICT agency and national data centre to strengthen e-government, establish a national technology park to spur research and development, and increase roll out of regional ICT centres to enhance connectivity to schools and rural communities.

The National Information and Communication Infrastructure Policy (NICI) is the sector's overarching policy framework. The country developed a four-year action plan (2014–2017) called ICT for Development part II (ICT4D II) an extension of part I, which was implemented from 2009–2012. The aim of ICT4D II is to disseminate ICT more widely across the sectors of the economy, covering ICT in agriculture, health and tourism. The goal of these plans is 'to put The Gambia on an accelerated developmental path that will transform its economy and society in the emerging technological, information and knowledge age into a knowledge-driven, high-income information society and economy'. The NICI2 is in progress and it will cover the period 2020–2025. Other related policies have also been developed, such as the 2013 Universal Access Policy and its regulations, which recognizes the importance of accessible and affordable ICT services for development across the country and seeks to achieve a universal service penetration of 100% of the total population for voice services and 50% for broadband within 10 years (International Telecommunication Union, 2013). The country is also planning to establish a national ICT agency in 2017/2018.

The different policies and plans focus on improved coverage and quality of ICT infrastructure, but there is a limited regulatory framework to support its diffusion to rural communities and small-scale firms are less visible. For instance, in the Education Policy 2004–2015, ICT is not conceived as a discipline to be taught itself, but rather as a tool for efficient management of the education sector and for the achievement of the Ministry of Higher Education, Research, Science and Technology (MoHERST)'s main priorities.

Similarly, there is a lack of regulatory framework to foster innovation. The private sector development strategy for Vision 2020 is considering innovation related exclusively to tourism and the need to develop other forms of 'sustainable' tourism (ecotourism, inland, cultural and community-based tourism). The Gambia National Agricultural Investment Plan (2011–2015) is also calling for innovative practices in the agricultural sector. Aligned with NDP, the National Export Strategy considers the establishment of a national innovation park (GIEPA, 2013). There is, therefore, a need for more legal support to foster innovation and establish a national innovation system.

Concerning cyber laws, The Gambia's ICT sector recently saw the enactment of the ICT Act of 2009, which has provisions in line with the Economic Community of West African States (ECOWAS) supplementary acts on electronic transaction and personal data protection, consistent with the harmonization of policies of legal and regulatory framework within ECOWAS. Through the ICT Act of 2009, The Gambia's regulatory framework has captured some of the digital policy areas required to develop the ICT sector, covering topics such as eDocuments. However, the sector's recent rapid development has already created gaps and grey areas where no legal coverage exists. It is thus important to broaden the legal framework for it to capture all the different elements of the new Internet age, e.g. cybersecurity and regulations governing flow of data, etc.

SECTOR SUPPORT INSTITUTIONS

The sector is not yet clearly coordinated through any sector-based associative mechanism. The Information Technology Association of The Gambia (ITAG) was founded at a time when the sector was very limited and many companies that integrated into the sector more recently are not aware of its existence. In order to grow further, the sector requires better coordination and a uniform approach to ensure that all services provided are reliable and on the same level of quality.

Table 3 summarizes the functions of the institutions supporting the ICT sector in The Gambia.

Table 3: Trade support institutions in ICT

	Functions and role
Policy support network	
Ministry of Information and Communication Infrastructure (MOICI)	The ministry has the responsibility of building and maintaining the national communication infrastructure (physical and systemic) to support the overall national development. MOICI has been empowered in the role of policymaker to liberalize the ICT. The ministry has five semi-autonomous institutions working under it, namely: <ul style="list-style-type: none"> • Gamtel • Gambia Postal Services Corporation (GAMPOST) • Gambia Printing and Publishing Corporation (GPPC) • Gambia Radio and Television Services (GRTS) • Department of Information Services
Public agencies	
Public Utilities Regulatory Authority (PURA)	The Gambia Public Utilities Regulatory Authority Act of 2001 provides for the establishment of the PURA to regulate the activities of providers of certain public utilities in the various economic sectors, among which is ICT.
Gambia Investment and Export Promotion Agency (GIEPA)	GIEPA has a pivotal role in The Gambia, as it is the sole national trade support institution with a mandate to promote and facilitate investment, trade and competitiveness of Gambian businesses.
National Record Service (NRS)	NRS is a government department that archives and manages The Gambia's public records throughout their entire lifecycle. These paper records are from different government ministries and they also aim to digitize all the paper records. Software was developed by a local company to scan and store documents.
Business services networks	
Information Technology Association of The Gambia (ITAG)	ITAG is a local NGO founded in 2004. Its mission is to promote the increased use and development of ICT as part of the country's socioeconomic development drive.
ICT training centres	University of The Gambia (UTG) TVET and training centres Kanifing Municipal Council: QuantumNet Institute of Technology (QIT), Young Men's Christian Association (YMCA) – computer centre, Sterling Consortium, Give1Project, Jokkolabs Banjul and Bansang Youth Centre Upper River Region: Balal Rural Empowerment Sustainable Development Initiative, Gambia Telecommunications and Multimedia Institute and Success Institute College Lower River Region: Rural community information centre North Bank Region: Ensa Touray Computer and Information Technology Training Centre West Coast Region: African Information Technology Holdings Limited, Suna Institute of Science and Technology, and Start Now Central River Region: Bansang Youth Centre
Entrepreneur support services	
Startup Incubator Gambia	Startup Incubator's objective is to support the successful development of young Gambian entrepreneurs through an array of business support services and resources, developed and orchestrated by incubator management and offered both in the incubator and through its network of contacts. Successful completion of the programme increases the likelihood that a business will start and stay in business for the long term.
Empretec Gambia	Empretec's objective is to train and prepare entrepreneurs to establish successful enterprises or grow and expand their businesses. Special emphasis is given to computer literacy and IT.
Civil society networks	
Abraxas Job Centre	Abraxas is a registered youth-led non-profit organization in The Gambia that aims to reduce youth unemployment. Abraxas is accredited by the National Training Authority.
Activista The Gambia	Activista The Gambia is a volunteer group of students and other young people from all over the nation. It is part of Activista, which is a global network of young activists and campaigners. Among other things, Activista provides training in leadership, campaigning and social media.

Selected development activities currently active in the sector

The following development initiatives were carried out in the sector:

- **ACE submarine cable:** ACE is a cable system along the west coast of Africa between the French Republic and the Republic of South Africa managed by a consortium of 19 operators and administrations headed by the company Orange. In 2012, the Africa Coast to Europe (ACE) submarine cable system landed in The Gambia, boosting Internet connectivity. The new capacity provided by the ACE cable has led to new market opportunities in the sector solely driven by mobile data revolution. Three out of four mobile operators upgraded platforms for 3G mobile broadband connectivity. The ACE submarine cable increased international bandwidth fourfold. Together with the low-cost mobile phones available in the country, this had a clear impact on the increase of mobile subscriptions in The Gambia.
- **Programme for Infrastructure Development in Africa (PIDA):** PIDA provides a vision and strategic framework for the development of regional and continental infrastructure (energy, transport, ICT and trans-boundary water resources). PIDA's overall goal is to promote socioeconomic development and poverty reduction in Africa through improved access to integrated regional and continental infrastructure networks and services. The PIDA Week 2016 event ended with a pledge to make infrastructure development a key enabler to youth employment.
- **PURA SIM registration:** SIM card registration was traditionally voluntary until the recent introduction of a mandatory registration deadline by PURA. Any subscriber who fails to register by the set deadline will have his SIM card disconnected and deactivated by the GSM operator, resulting in the loss of the subscriber's number. This exercise is aimed primarily at reducing mobile phone-related crime such as money laundering, cyberterrorism, prank calls and so on. In addition, this exercise enables government to monitor and verify the actual teledensity figures and active lines in the industry.
- **National cybersecurity management framework:** In line with the Information and Communications Act 2009, the authority in collaboration with the MOICI is in the process of establishing a national cyber security management framework. The Computer Incident Response Team Coordination Center will serve as the national coordination and collaboration centre for cybersecurity management. The International Telecommunication Union (ITU) carried out the first assessment of the readiness to implement a National Computer Incident Response Team (CIRT). In addition, the authority facilitated the formation of the National Cyber Security Steering Committee (NCSC).
- **Investment promotion:** In 2001, The Gambia promulgated The Gambia Investment Promotion Act and The Gambia Free Zones Act to regulate local and foreign investment. This Act has been set to ease business establishment and attract investment. Sector-specific regulations apply to FDI in ICT. Although the ICT infrastructure is not wholly open for investors, proposals geared towards improving the infrastructure, particularly broadband technologies, for extending access are highly welcome from potential investors for consideration. The bulk of FDI has been in the power generation, financial and IT sectors.

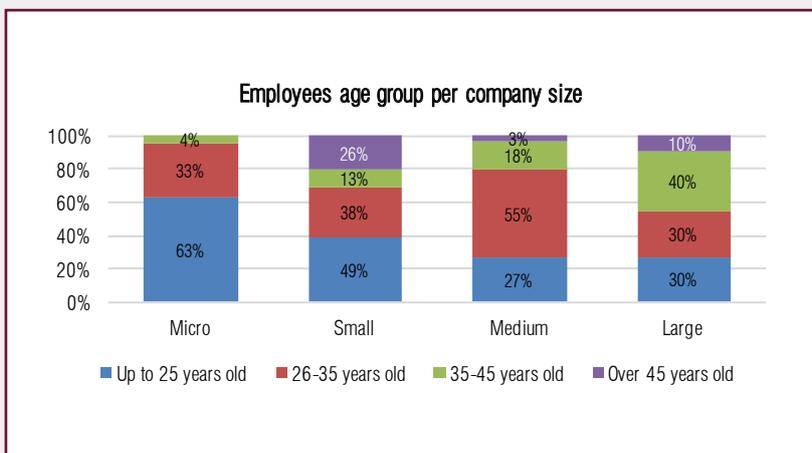
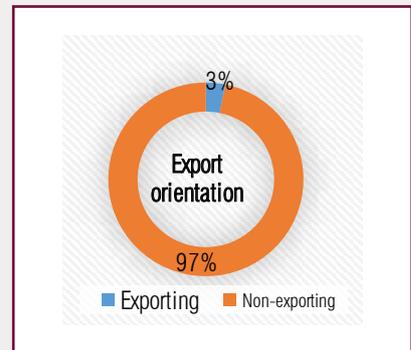
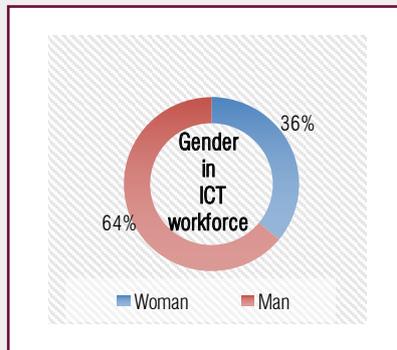
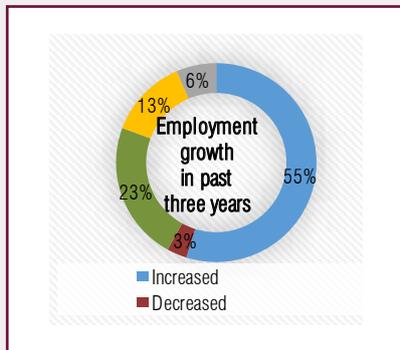
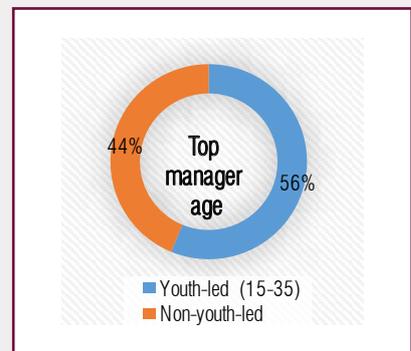
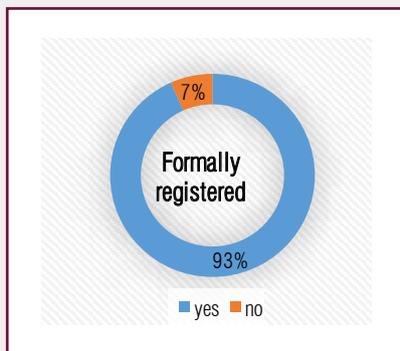
KEY COMPETITIVE CONSTRAINTS IN THE ICT SECTOR

The competitiveness constraints in the ICT sector were identified based on two major sources: a SME Competitiveness Survey (SMECS) carried out by ITC and stakeholder consultations held in Banjul and the regions. The survey data was collected with the help of GIEPA. The survey was conducted on 32 firms. Box 1 presents basic sample information. Micro and small firms represent the largest share, with 82% of the surveyed enterprises. It is very important to highlight that

youth (younger than 35 years old) represent approximately 88% of the workforce in micro, small and medium-sized enterprises. It is also key to note that, unlike other sectors in The Gambia, youth-led enterprises represent the majority of firms (56%). Furthermore, only three firms are reporting some kind of exports in ICT. It is to be noted, however, that those firms do not export ICT services, but resell hardware-related goods in the region.

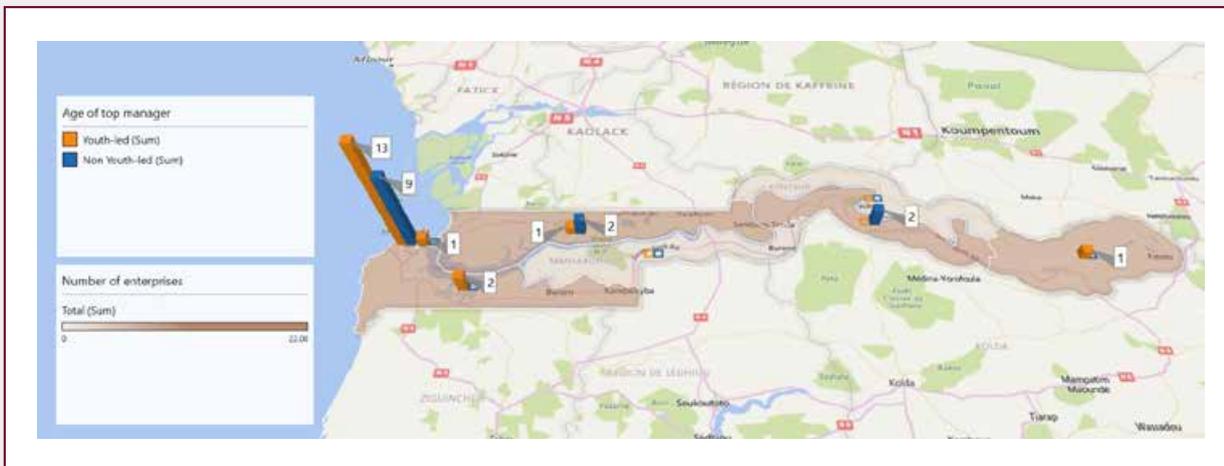
Box 1: Snapshot of the surveyed ICT sector sample

Formal registration	The majority of surveyed companies claim to be formally registered.
Top manager gender	All ICT companies' top managers are men.
Gender in ICT workforce	Women represent 36% of the ICT workforce.
Top manager age	A total of 56% of ICT companies are led by managers less than 35 years old.
Export orientation	Only 3% of ICT companies are export oriented.
Employees' number evolution in past three years	In the last three years, 55% of ICT companies have increased their number of employees, 23% remained the same and 13% are start-up companies.
Employees age group per company size	Youth (less than 35) are majority employed in micro and small companies and represent approximately 90% of the workforce in micro, small and medium-sized enterprises.



Source: ITC SME Competitiveness Survey.

Box 1: Snapshot of the surveyed ICT sector sample (cont.)



Source: ITC SME Competitiveness Survey.

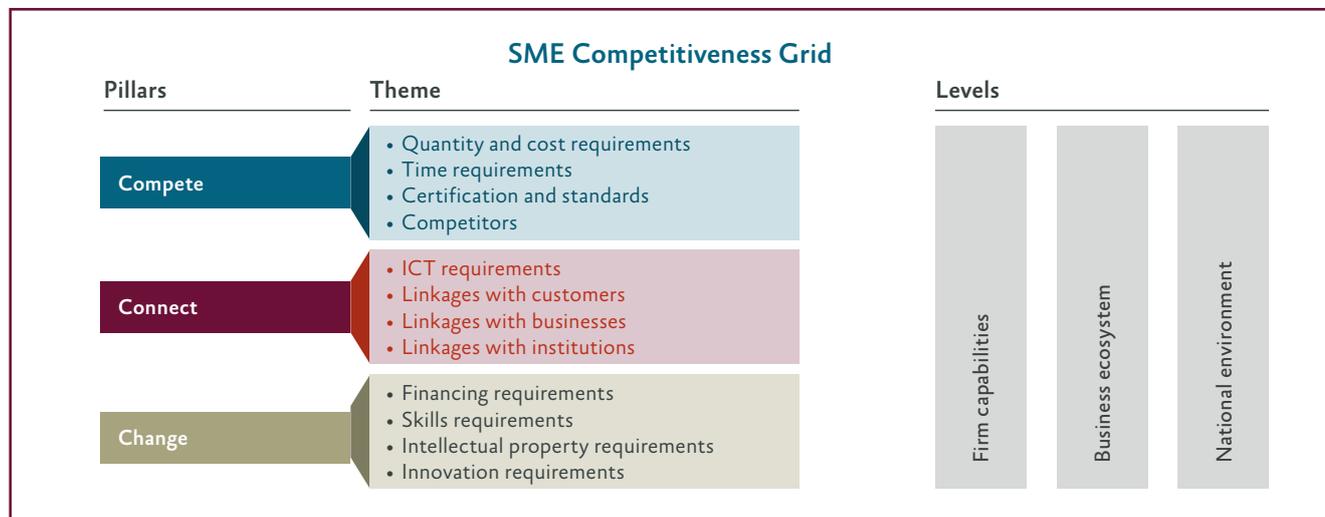
The ITC SME Competitiveness Survey assesses firms’ strengths and weaknesses, the wider business ecosystem and the national environment to help identify what bottlenecks to growth firms are facing. The survey is split into three key pillars:

- **Capacity to compete** is the static dimension of competitiveness. It assesses whether current production is efficient and meets market requirements.
- **Capacity to connect** is the connectivity dimension of competitiveness. To be competitive, firms must link to

customers, businesses and institutions, and be literate in information and communications technology.

- **Capacity to change** is the dynamic dimension of competitiveness. It assesses whether firms have the capacity to make human and financial investments to adapt to fast-changing markets.
 - The pillars are further subdivided into two levels.
- **Firm capabilities** assesses whether firms can manage resources under their control;
- **The business ecosystem** is made up of support institutions that supply enterprises with the resources or competences they need to be competitive.
- How the pillars and levels fit together is shown in table 4.

Table 4: SME competitiveness grid



Source: ITC SME Competitiveness Grid.

The following two sections will present an overview of the results on the two levels, the firm capabilities and the business ecosystem. Each level is then analysed, focusing on the theme showing the lowest performance.

Note: The rankings are always presented in a score between 0 and 100, with 100–80 scoring as excellent, 80–60 as good, 60–40 as satisfactory, 40–20 as poor and 20–0 as very poor.¹⁵

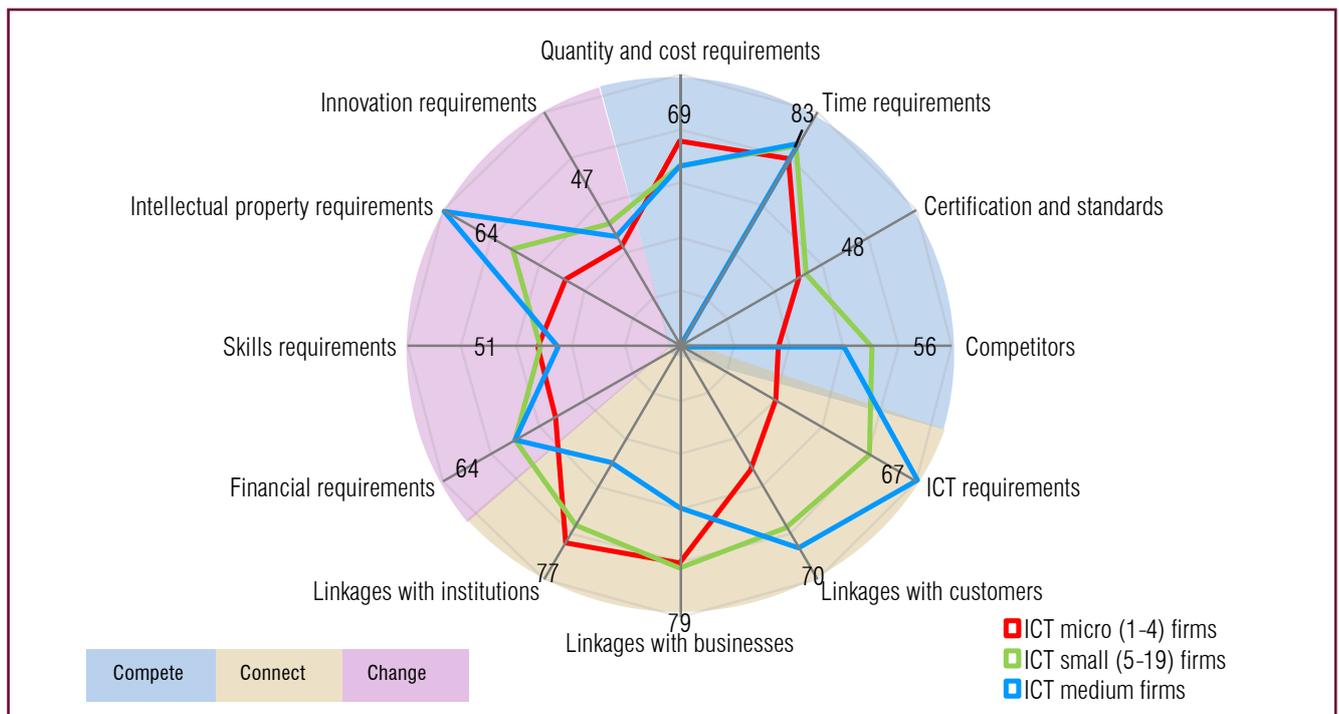
15.– For more details on ITC's SME Competitiveness Survey, visit: <http://www.intracen.org/SMECS/>.

FIRM LEVEL CAPABILITIES AND COMPETITIVENESS ISSUES



Photo: ITC

Figure 8: Firm level competitiveness scores



Source: ITC's SME Competitiveness Survey.

The SME Competitiveness Survey identified international standards certification, cost competitiveness (especially on the indicator related to input costs), skills requirements and innovation investments as the major issues for surveyed ICT enterprises (see figure 8). Stakeholders confirmed the results during sector consultations. It is important to highlight the high level of disparity of performance between micro, small and medium-sized enterprises.

Capacity to compete

Gambian firms in the ICT sector present the lowest performance in their capacity to compete in the following areas:

- **Quantity and cost competitiveness:** The high cost of Internet subscription remains one of the primary hindrances to broaden firms' access, where 48% of the population lives in poverty. The introduction of 3G wireless Internet connections via mobile devices has made Internet more accessible, but only a small subset of the population can afford the data packages.

Additionally, apart from four telecom companies, the rest of the ICT sector is mostly constituted of micro and small-sized enterprises that cannot absorb the development of large IT projects on their own owing to the inherent low human and capital resources. This is leading to high opportunity costs; for instance, in the case of public procurement opportunities on which local firms cannot bid. The sector can benefit from increased collaboration between local enterprises joining forces and bidding for larger projects together, especially in the case of public tender.

- **Certification and standards:** Firms' ability to compete is also mostly affected by the inexistence or low level of compliance with internationally recognized quality or performance standards at the national level. The lack of a quality certification system impedes the development of a minimal quality standard among ICT companies, which deeply hampers clients' confidence. This issue is particularly important in the case of micro and small ICT companies.

Capacity to change

Firms' capacity to evolve according to their markets' needs is limited in the following areas:

- **Skills requirements:** Knowledge and technical competences are reported to be a major constraint for private companies. Most firms complain about the skills gap. As detailed previously (see occupational skills gap, page 28) employees' competency in the ICT sector varies significantly between occupations. On one hand, lower level occupations or elementary occupations face competency level problems. On the other hand, professionals involved in higher levels of task complexity are rated competent, but are few in number and thus quite difficult to find in the job market.
- **Innovation requirements:** Most firms in the sector do not engage in research and development (R&D) activities given their limited human and financial resources capacities. There is very limited collaboration between Gambian companies to innovate or to develop collaboration with foreign tech hubs, suppliers or networks that promote innovation.

Table 5 summarizes the main competitiveness issues at the company level.

Table 5: Main competitiveness issues at the company level

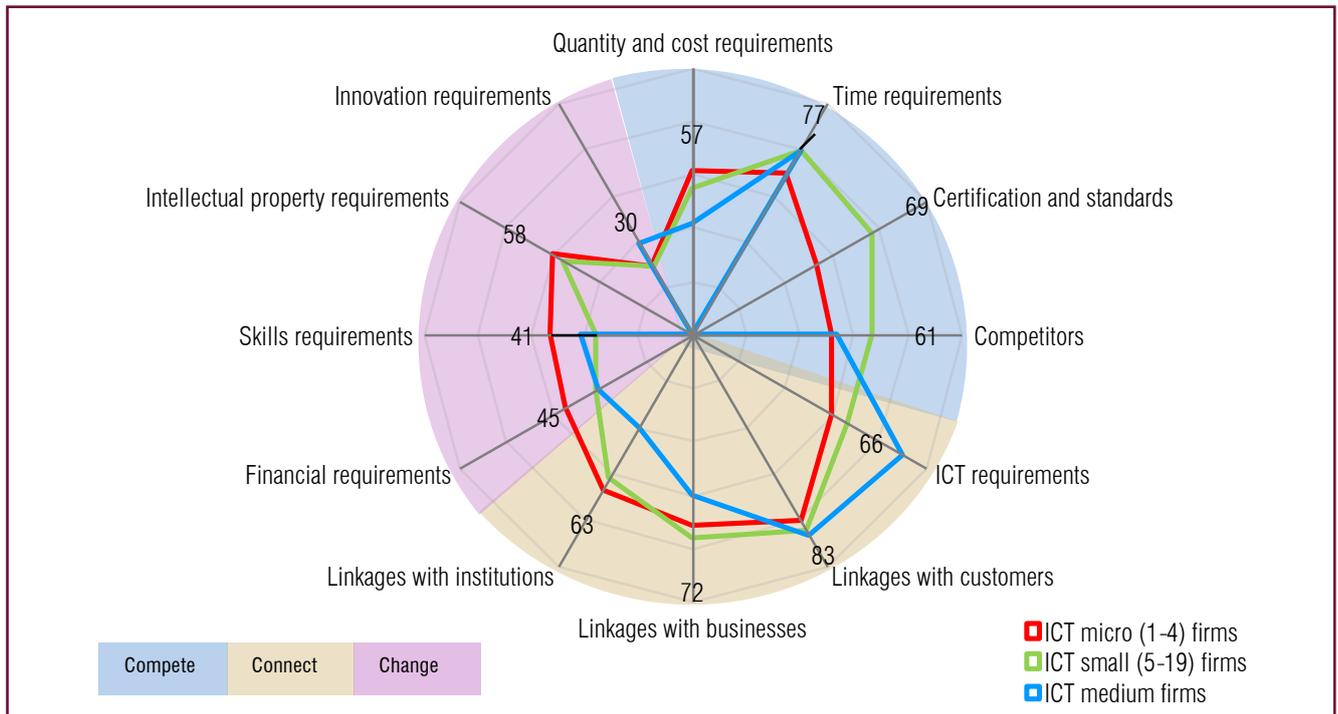
Firm capabilities in the ICT sector				
		Stakeholders' constraints	Urgent action needed	Ease of resolution
Compete	Quantity and cost competitiveness	<ul style="list-style-type: none"> • High cost of Internet subscription remains one of the primary hindrances to broaden its access. • Limited capacities to develop a large project given the small size of ICT companies. 		
	Certification and standards	<ul style="list-style-type: none"> • No quality certification system allowing a minimal quality standard among ICT companies, which hampers clients' confidence. 		
Change	Innovation requirements	<ul style="list-style-type: none"> • Most firms in the sector do not engage in R&D activities given their limited human and financial resources capacities. 		
	Skills requirements	<ul style="list-style-type: none"> • On one side, lower-level occupations or elementary occupations face competency level problems. On the other side, professionals involved in a higher level of task complexity are rated competent, but are quite difficult to find in the job market. 		

BUSINESS ECOSYSTEM CONSTRAINTS

Business ecosystem, as used in this roadmap, refers to factors that are external to the firm, but within its micro-environment. While many external factors affecting firms' capacity to compete are determined at the national level and affect the overall economy, conventional wisdom is that a firm's level competitiveness is also shaped by its micro-environment. As Porter puts it: 'It is hard to concoct a logic in which the nature of the arena in which firms compete would not be important to performance outcomes.' (Porter, 1998)

Figure 9 presents the assessment results for the business ecosystem in which ICT firms operate. The overall results show that the capacity to change is the most affected. It is to be noted that again skills requirement as well as financial and innovation are areas that affect ICT firms' competitiveness in general in their capacity to change. These results are supported by stakeholders' consultations outputs, and are complemented by issues related to policy and regulation.

Figure 9: Business ecosystem competitiveness scores



Source: ITC's SME Competitiveness Survey.

Capacity to change

Firms' capacity to evolve according to their markets' needs is limited in the following areas:

- Skills requirements:** Skills gap is a major factor affecting MSMEs' capacity to change and provide improved services. ICT training is mostly concentrated on basic IT skills. Various training providers offer different levels, from basic training on how to use a computer and basic office software to some advanced training on specific topics. However, the quality of the training is very heterogeneous between TVET and even between courses. There is no standardized quality assurance mechanism established by the National Accreditation and Quality Assurance Authority (NAQAA) or between TVET carrying out ICT-related courses. Additionally, specific topics like graphic design or multimedia production are in high demand, but with a very limited offer. In the same way, software and website development, while offered by different TVET, are ranked as being of poor quality by the private sector. In these areas, ICT companies mention that they have to train their new recruits themselves or eventually recruit from abroad.
- Financial requirements:** Access to financial institutions is a major obstacle to the operations of MSMEs, negatively impacting their capacity to change. Through various consultations and during the Youth Employment Forum

organized in the context of the Youth and Trade Roadmap, it appears that commercial banks are unwilling to give up on their traditional lending instruments to accommodate the financing needs of low-income groups. This is particularly true for micro and small-sized enterprises, where adequate financial instruments for the development are lacking. Although The Gambia's financial system has become more liberalized in the last years, policy changes in the legislation and Financial Institutions Act (FIA) still need to target MSMEs and provide suitable services.

Capacity to compete

The business ecosystem limits firms' capacity to compete, given the high level of competition between companies.

- Quality and cost requirements:** The local market potential is not fully exploited due to a significant urban-rural divide. In general, rural areas suffer from poor or virtually non-existent infrastructure, a lack of affordable electricity and frequent power cuts. In addition, data coverage of rural areas is well developed, but not affordable to the rural population. The access to mobile data is limited to messaging. Additionally, the older generation's ITC literacy level is extremely low and not sufficient to engage in usage of mobile apps or online services.

- **Competitive environment:** The small market size has dictated the sector's slow development pace. The level of competition is very high, as market opportunities are scarce and public investment limited. Additionally, the competition among companies is not properly regulated. There are examples of companies claiming to offer 4G network, even though the service does not exist in The Gambia.

Capacity to connect

The business ecosystem limits firms' capacity to connect mainly due to poor services delivered by support institutions, public agencies and network services companies.

- **Linkages with institutions**

The sector is not yet coordinated through any broad associative mechanism. The ITAG was founded in a period when the sector was very limited and many companies that integrated into the sector more recently are not aware of its existence.

The regulation of the ICT sector is not in line with the sector's evolving needs. Businesses report lengthy and complicated bureaucratic processes, worsened by frequent preferential practices. The Internet or mobile registration process is expensive and cumbersome.

Taxation is very high on ICT companies, sometimes up to 23%, which is one of the stated reasons that companies can rarely afford to invest in R&D or personnel training.

- **ICT requirements:** Micro and small companies complain about the lack of efficiency of network service companies. There is a lack of transparency in the ISP taxation system, which makes it very difficult to get information on

companies. Additionally, there is no mobile data usage monitoring mechanism in place. In most cases, the consumer is not aware of this. Very often, it results in services overpricing. There are reported cases where the operators charge full cost after only one third of the credited data is used.

Table 6 summarizes the main competitiveness issues in the business environment.

The ICT sector in The Gambia has grown from a very low base in the past 10 years due to the liberalization of the access to the ACE submarine cable system. Even if the sector remains marginal compared to the country's major economic drivers, such as agriculture and tourism, it has great potential to grow, since the minimal medium to access the national market – mobile Internet access – is now widely available.

However, the outsourcing of operations by some of the major ICT companies represents a growing threat that could limit the sector's potential to generate employment, especially for youth.

It is essential that relevant skills are present nationally in order for companies to avoid outsourcing their operations. Mitigating the urban-rural skills divide would also be crucial to ensure benefits are not only felt in the Banjul and Kanifing areas.

Table 6: Main competitiveness issues in the business ecosystem

External factors affecting firms' competitiveness in the ICT sector				
Stakeholders' constraints			Urgent action needed	Ease of resolution
Compete	Quality and cost requirements	<ul style="list-style-type: none"> • Significant urban-rural divide in terms of access to Internet and access to electricity impedes the development of mobile services. 		
	Competitors	<ul style="list-style-type: none"> • Small market size limits market opportunities and fosters fierce competition between companies. • Weak regulation enforcement. 		
Connect	Linkages with institutions	<ul style="list-style-type: none"> • Lack of sector coordination for development and support activities. Weak sector association. • Businesses report lengthy and complicated bureaucratic processes, worsened by frequent preferential practices. The Internet or mobile registration process is expensive and cumbersome. • Taxation is very high for ICT companies, sometimes up to 23%, which is one of the stated reasons that companies can rarely afford to invest in R&D or personnel training. 		
	ICT requirements	<ul style="list-style-type: none"> • Lack of transparency in the ISP taxation system. • Absence of genuine mobile data usage monitoring mechanism for consumers. 		
Change	Skills requirements	<ul style="list-style-type: none"> • Firms report difficulty in finding specific skills in the local workforce, specifically in software and multimedia development, app development and testing, database, telecommunication, web content, device repair and user support. 		

SKILLS DEVELOPMENT ISSUES, SKILLS GAP ANALYSIS AND TVET MAPPING

A local workforce with strong ICT literacy and skills is a key determinant to develop the sector and attract FDI, and a prerequisite for The Gambia to become a regional hub. This section will present the status of digital skills in The Gambia and the skills gap analysis in the ICT sector.

One of the main challenges The Gambia's economy is facing is the absence of a skilled labour force. The adult literacy rate is 51%. Close to 60% of the labour force has no formal education. According to the 2012 Gambia Labour Force Survey, 10.9% of the population of 15 years and older has received some vocational training qualification and only 1% of the working population in urban area has a university diploma.

To support the skills gap assessment done during the design phase of the Youth and Trade Roadmap, ITC added a specific module to its SME Competitiveness Survey. The results of the skills gap analysis presented below provide a greater understanding of the issues related to youth recruitment and the occupational skills gap in the ICT sector. Additionally, the survey results help to identify the most-needed occupations and the types of training, internship and mentoring programmes provided by MSMEs in the sector.

AVAILABILITY AND QUALITY OF LABOUR

The information and communication sector only represents 0.5% of the services, employing 2,529 people. This shows a certain marginality of the sector, limited to the telecom services. The availability of qualified labour is an important indicator of The Gambia's readiness to diversify in the ICT sector.¹⁶ In order to initiate a specialization degree in ICT, there is a need for a minimum of a full primary school diploma (for the lowest qualification levels) and, in most cases, for having finished secondary education.

In terms of employment share, the operator Gamtel continues to dominate the employee base in the ICT sector, accounting for more than 54% of total employees within the sector. However, the ICT sector recorded a 9% decrease in the total number of employees due to a decrease in the number of contract workers. Africell saw the largest drop of employment. This is due to a growing trend in several telecom companies to outsource call centre-related operations to a third party provider.¹⁷ In the other sectors, **most companies report hiring only internal IT staff** and recruit staff,



Photo: ITC

particularly in the accounting department, who can manage existing software. Most other profiles are in demand from IT companies, as most of these services are outsourced by non-governmental organizations (NGOs) or private sector companies.

Widespread ICT literacy is an important target of The Gambia. As the country is investing in ICT as a future strong sector for its economy, increasing ICT literacy has become one of the main goals of the educational system.¹⁸ Even if the target is reachable, some obstacles need to be overcome. The cost of information and communication technology services (ICTS) is still too high for the population, as well as the prices for accessing the Internet. These constraints keep people far from the ICT sector, as they cannot see its relevance in their everyday lives. In order to increase the percentage of ICT literates, the country needs to provide incentives for the purchase of computers through ad hoc programmes. Specialized centres, schools and universities are supporting the cause of ICT literacy, offering training and classes for the youth.

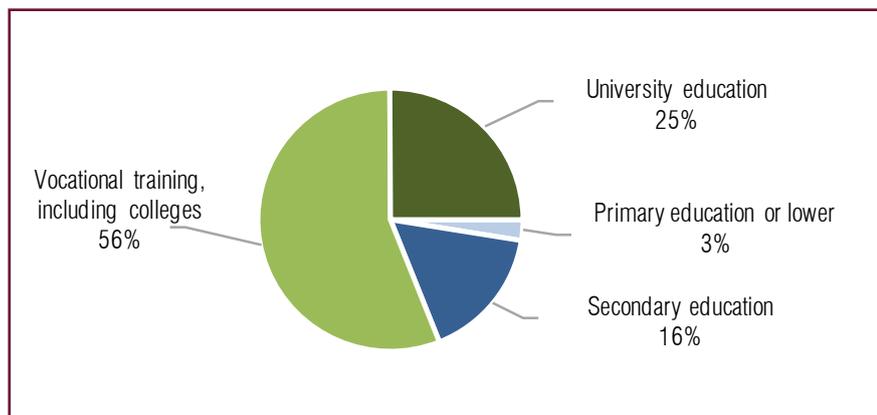
Employees' level of education in ICT is spread between TVET and university education. The results of the ITC SME Competitiveness Survey shows that the level of education in ICT is higher than in the rest of the economy, with university and TVET-educated employees representing close to 81% of the workforce. Surprisingly, the share of employees with vocational training is slightly higher than for university education, whereas the level of competency required in the ICT sector is usually at university level. The lack of diversified ICT education at university level is one of the main reasons for this and is further analysed in the TVET section. Additionally, 16% of employees only have a secondary education.

16.– <http://reports.weforum.org/global-information-technology-report-2016/economies/#economy=GMB>.

17.– PURA annual report.

18.– <https://www.widernet.org/sites/default/files/Gambia.pdf>.

Figure 10: Level of education of employees in the ICT sector



Source: ITC SMECS The Gambia, 2017.

SKILLS GAP ANALYSIS

Youth recruitment across sectors and level of competency

Enterprises in the ICT sector claim cost of employment to be the greatest barrier in employing young people, followed by the poor attitude toward work and unsuitable qualification. This perception from the company might be explained by the relative scarcity of qualified and competent young people, which could be reflected in higher salary compared to other sectors. Additionally, the survey shows that unsuitable qualifications and cost of additional training required are the greatest barriers in employing young people. This clearly shows the skills gap between the private sector's needs and the level of competence of young people looking for a job in the ICT sector.

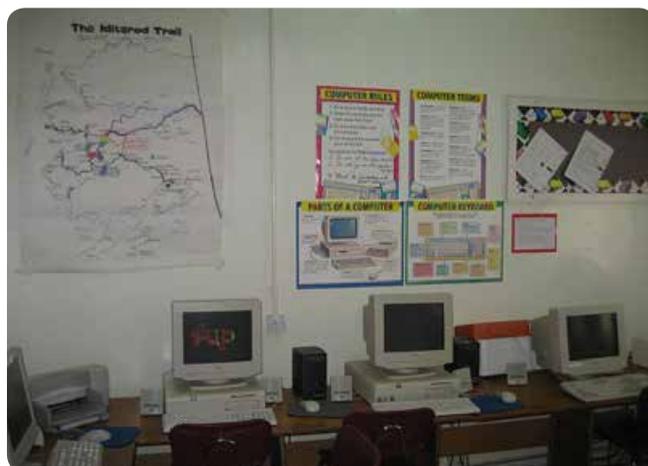
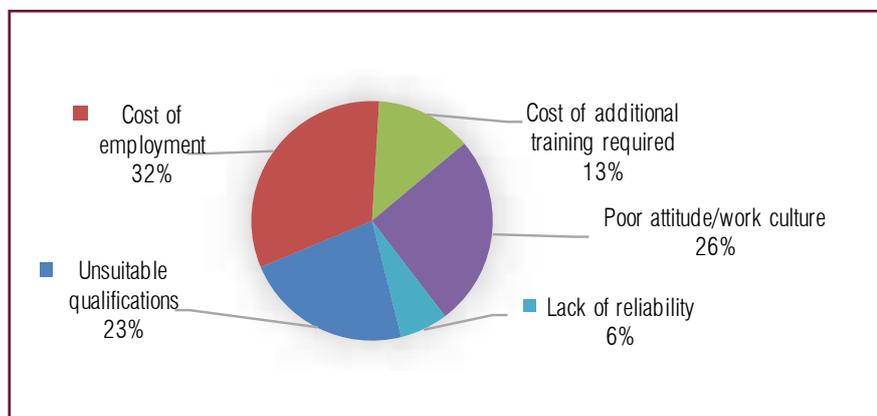


Photo: ITC

Figure 11: Overview of barriers in employing young people by sector

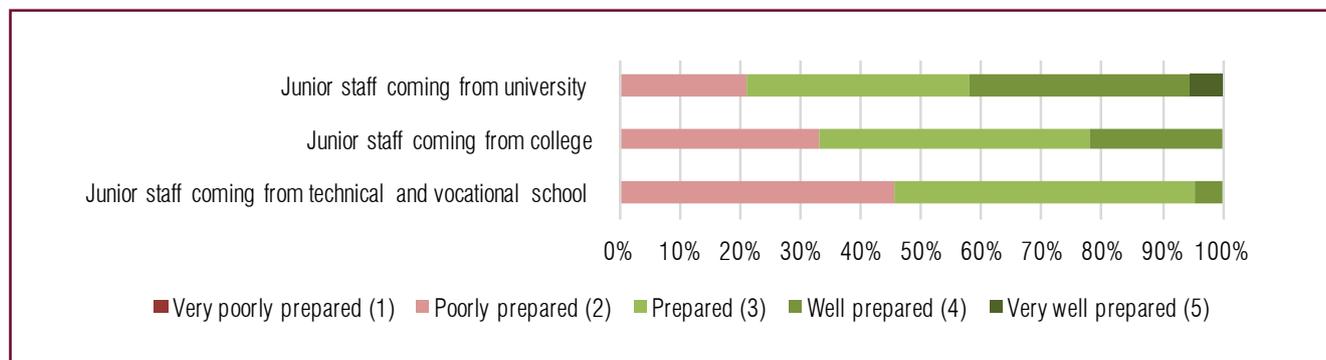


Source: ITC SMECS The Gambia, 2017.

Junior staff coming from university are slightly better prepared to perform successfully in their jobs than those coming from colleges or vocational and technical schools. It is important to highlight that 50% of staff educated in technical and

vocational schools are qualified as 'poorly prepared', whereas they represent 56% of the employees in the ICT sector (see figure 12). The education level provided by TVET seems to be one of the main sources of the skills gap in the ICT sector.

Figure 12: Preparedness of staff by level of education



Note: Green shades indicate higher level of preparation. Source: ITC SMECS The Gambia, 2017.

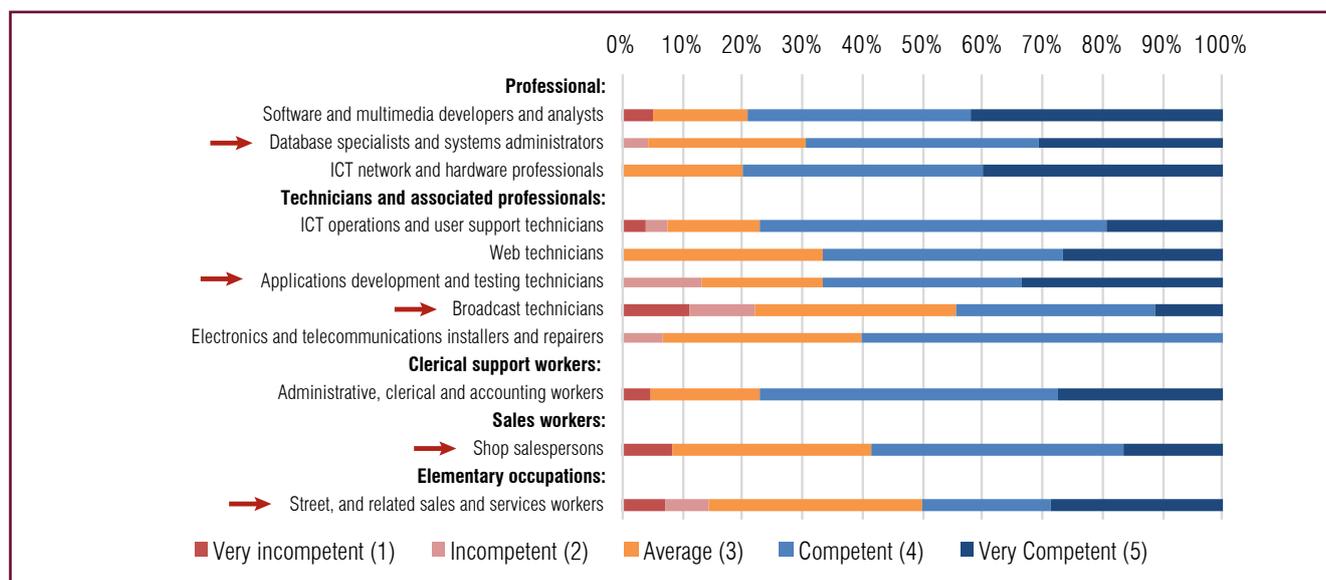
Occupational skills gap

The competency of employees in the ICT sector varies significantly between occupations. Professionals whose occupations involve higher levels of task complexity are rated competent, with 80% of respondents claiming software, ICT network and hardware professionals to be competent. Meanwhile, lower level occupations or elementary occupations face competency level problems. As shown in figure 13, there are four particular occupations that seem to present clear lower competency levels:

- Broadcast technicians
- Shop salespersons
- Database specialists and systems administrators
- Applications development and testing technicians.

Additionally, professions related to street, and related sales and services workers present relatively high levels of incompetency.

Figure 13: Level of competencies – ICT



Note: Blue shades indicate higher level of competency. Source: ITC SMECS The Gambia, 2017.

Most-needed occupations

The following occupations are sorted based on the magnitude of the skills gap that is measured by the frequency of that occupation appearing on the most-needed list of respondents and the level of difficulty of finding a person with appropriate skills that match the job description.

The most-needed occupations in the ICT sector with the largest skills gaps are:

- Software and multimedia developers and analysts
- Applications development
- ICT network and hardware professionals.

The wide disparity between staffing needs and qualified applicants, particularly in the occupations that require highly technical or specialized skills, indicates a shortage in skilled workers. While finding a promising candidate to fill such positions is difficult (perhaps due to the specificity of the skills needed), companies that succeed in securing the positions are usually satisfied with the skills level of their staff (as shown in figure 13).

Occupations	Score
Software and multimedia developers and analysts	19
Applications development and testing technicians	13
ICT network and hardware professionals	10
Web technicians	9
Database specialists and systems administrators	9
Information technology and telecommunications directors	6
Sales and marketing	5
Shop salespersons	5
Electronics and telecommunications installers and repairers	3
Personal services workers	3

Source: ITC SMECS The Gambia, 2017. (Partial results displayed. Complete list available upon request.)

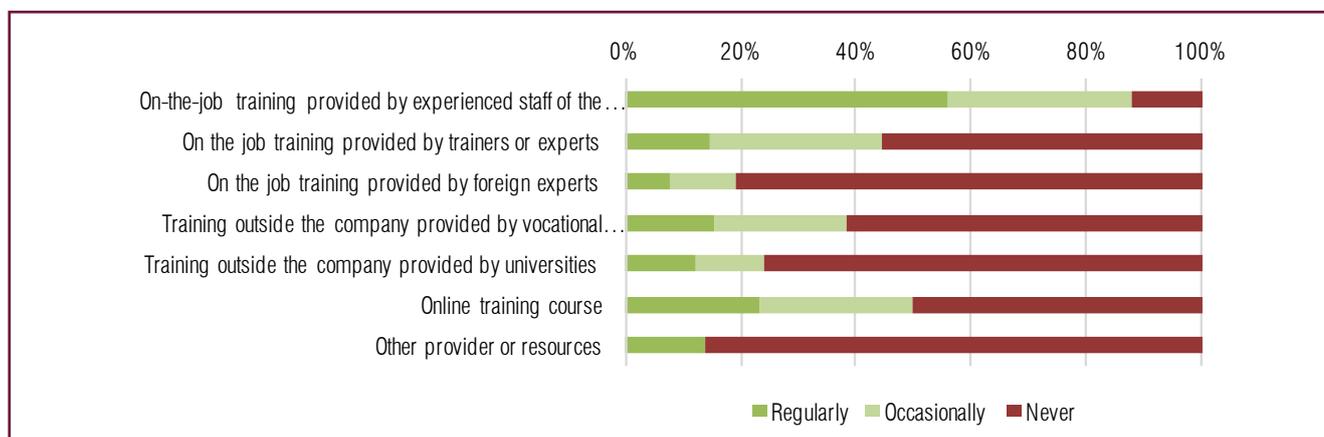


Photo: ITC

Types of training, internship and mentoring provided to overcome the current skills gap

The majority of ICT companies claim to provide on-the-job training to overcome the skills gap and only half use online training courses. The most common method regularly used by ICT companies to upgrade their employees' skills is to call on experienced staff (close to 55% of companies) to deliver on-the-job training. It is important to highlight that no other form of training is provided on a regular basis besides online training. It is surprising to note that only 50% of ICT companies reinforce staff skills through online training given the vast amount of free quality educational material accessible online. On the contrary, 50% of ICT companies use external trainers or experts, but only 20% call on the services of foreign experts. Concerning the use of other external training providers, a bigger proportion of ICT companies use the training services of TVET compared to universities.

Figure 14: Types of training and mentoring provided

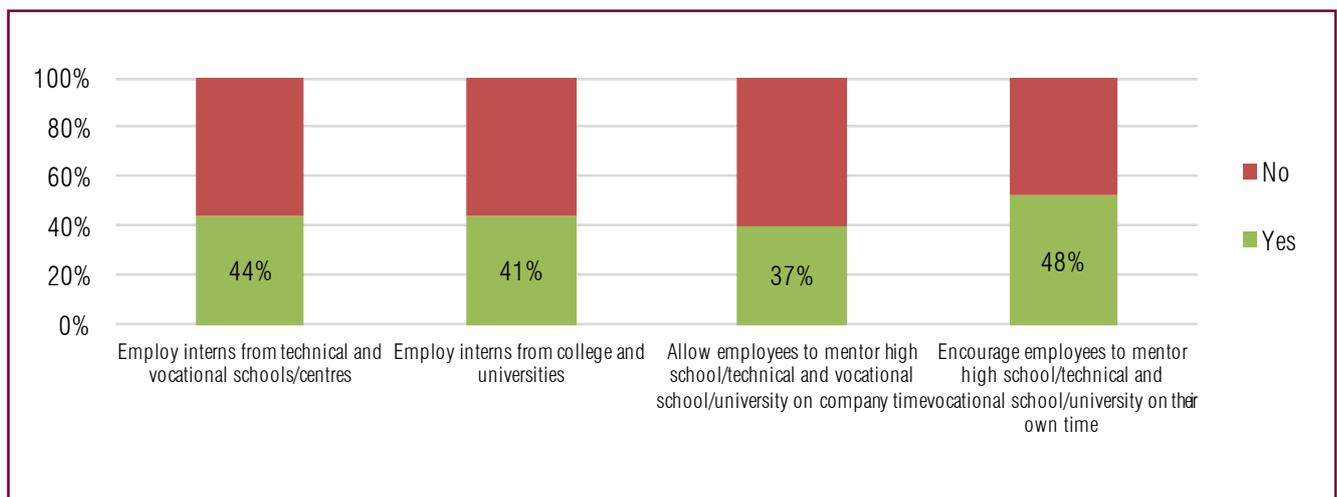


Source: ITC SMECS The Gambia, 2017.

Less than half of the companies employ interns and facilitate mentorship. When looking at the detailed information, approximately 40% of the companies employ interns coming from technical and vocation schools and university. It is very surprising to see that only 44% of the companies in the ICT sector employ interns from TVET, whereas 56% of the employees have been educated in the TVET (see figure 15). Internship should be an important part of TVET educational programmes. Given the low level of preparedness of students following TVET education (see figure 15), it is important that a greater number of companies hire interns. This would be a way to improve the overall competency level in the sector.

Less than half of the companies promote mentoring of their employees with vocational school or university. The share of companies allowing employees to mentor high school, university, technical and vocational school students on company time represents only 37%; the percentage increases to 48% when it comes to companies actually encouraging employees to mentor on their own time. This demonstrates room to improve the collaboration between the private sector and training providers to find a way to better match the needs of businesses and reduce the skills gap in youth employment.

Figure 15: Facilitation of mentorship or internship by firms in the ICT sector



Source: ITC SMECS The Gambia, 2017.

TVET MAPPING

When looking at the TVET landscape in The Gambia, the ICT sector's limited size mirrors a limited range and scale of the offer for ICT-related training and education. The ICT-related skills acquired among the young population (aged 15 and older, based on the 2012 Labour Force Survey), including computing and phone repair, amount to less than 2% of all skills, with respectively 1,887 claiming to have received these trainings through a TVET institution in 2012.

Five TVET institutions offer training specializing in the ICT sector. **Among those institutions, the YMCA and QIT have a main focus on ICT.** Both of them are private entities and fee-based institutions.

- **QuantumNet Institute of Technology (QIT):** QIT was founded in 1998 under the name of QuantumNet Training Center, but changed its name in 2007. The institute's aim is to equip the people with the requisite IT skills to make them functional and successful in a world increasingly being transformed by IT, and to make the training for such

skills widely accessible and affordable. It is specialized on A+, PC repairs and maintenance, Cisco Certified Network Associate (CCNA), Microsoft Certified Solutions Associate (MCSA), web design and MS Applications.

- **YMCA:** YMCA Gambia was established in 1979. The Gambia YMCA's aim is to help develop the potential of the youth and empower them with the necessary skills to be able to live and operate in a global context. It offers courses on computer literacy and information technology, software application, web authoring, desktop publishing, IT support, multimedia, filming and video editing, and sound and music production, as well as a diploma course in computing science and business management, delivered in collaboration with Saint Mary's University, Halifax, Nova Scotia, and the University of The Gambia.

In addition to these five TVET institutions, four private firms provide specific short-term training: Unique solutions (mobile phone repair training), NICE Gambia (IT and business courses), Nifty (computer literacy, web design and hardware repair) and Lasting Solutions (general IT training).

Apart from TVET, it is important to mention the important role of the University of The Gambia (UTG) in ICT education in The Gambia. Founded in 1999, the University of The Gambia provides relevant and sustainable tertiary education and research, in respect of socioeconomic, scientific and technological advancement and development. The aim of this institution is to be the powerhouse for the transformation of The Gambia through the creation, application and transfer of knowledge. It offers the most advanced

qualification levels on the subject with a BSc Computer Science and a BSc Information Systems. The number of applicants to the School of Information Technology, delivering these BScs, was on the rise over the past two years with a total of 49 applications in fall 2015 and almost the double the next year with 95 applicants.

Table 7 provides a summary of the main ICT training providers.

Table 7: University and main TVET institutions in ICT

Name of institution	Status	Region	Number of graduates in 2016 (% women)	Total number of teachers / instructors	Standard duration of the training course	Level	Courses offered by the institution
University of The Gambia (UTG)*	Public	Banjul	1 310 (35%)	226 lecturers full time and 50 part time	9 months for diploma and 3-year or 4-year degree programmes	Bachelor's, diploma	BSc Computer Science, BSc Information Systems, Diploma in Information Technology
Public TVET							
Management Development Institute*	Public	Banjul	1 500 (60%)	32 full time and 32 part time	6 months	Advanced diploma, diploma, certificate	Certificate in IT, Advanced Diploma in IT, Diploma in Programming, Cisco Certificate Network Associate
Gambia Technical Training Institute (GTTI)*	Public	Banjul	2 000 (15%)	140 full time and 15 part time	6 months to 3 years	Diploma, certificate	Certificate & Diploma Software Application, Technician Certificate & Diploma Information Processing, Certificate in Computer Engineering, High National Diploma Computer Science
Bansang Youth Centre – IT support	Public Under NYC	CRR-South	N/A	N/A	N/A	Basic	The IT training centre is managed by the Bansang Youth Development Association and supported by the youth centre. The IT training centre offers paid classes and free classes for students who don't have IT in their school. The IT training centre is the only IT training centre in the Central River Region.
Gambia Telecommunications and Multimedia Institute (GTMI)		Banjul and URR	N/A	N/A	N/A	Diploma, certificate, foundation	In Banjul, courses offered are IT essentials (PC hardware and software), scaling networks, cybersecurity essentials, introduction to networks, routing and switching essentials and connecting networks GTMI Basse Annex is a regional training centre: Foundation, certificate and diploma.
Private TVET							
QuantumNet Institute of Technology*	Private	Banjul	2 000 (40%)	10 full time and 4 part time	3 months to 12 months	Advanced diploma, diploma, certificate	A+ PC repairs and maintenance, Cisco Certified Network Associate (CCNA), Microsoft Certified Solutions Associate (MCSA), web design and MS applications
Microtech Institute of Multimedia & Technology*	Private	Western	120 (21%)	7 part time	4 months to 12 months	HND/graduate diploma, advanced diploma, diploma certificate	IT user skills, Diploma in Computer System and Network, Diploma in Network Implementation, Certified Technology Associate, Certified Solution Expert, Database Management SQL & MySQL, programming, web design and development, graphics, higher education qualification – HEQ: certificate, diploma and professional graduate diploma under BCS-UK.
Nifty School of Computer Technology*	Private	Banjul	106 (46%)	3 full time and 3 part time	6 weeks to 24 weeks	Diploma, certificate	ICT – IT Foundation, Certificate in IT, Diploma in IT, modular courses in Microsoft applications (Word, Excel, Access Windows, Publisher), MCSE, Microsoft Certified Solutions Associate (MCSA), website design and development, Java Programming, Comptia A+ and Microsoft Visual Basic
Gaye Njorro Skills Centre Farafenni Annex*	Private	North Bank	120 (92%)	7 full time	1 year	Certificate	Basic IT and catering
Future in Salikenni*	Community-based	North Bank	66 (N/A)	2 for the ICT	1 year	Certificate	Basic computer user skills

Name of institution	Status	Region	Number of graduates in 2016 (% women)	Total number of teachers / instructors	Standard duration of the training course	Level	Courses offered by the institution
Smart Technologies*	Private	Banjul	389 (64%)	7 full time and 4 part time	6 months to 9 months	HND/Graduate diploma, advanced diploma, diploma certificate	ICT software, hardware, networking and multimedia
Insight Training Centre*	Private	Banjul, Upper River, Western	175 (41%)	7 full time and 31 part time	1 year per level	Advanced diploma, diploma, certificate	Computer repairs and maintenance
Sterling Consortium*	Private	KMC	118 (41%)	4 full time and 5 part time	1 month, 3 months or 6 months	Diploma, certificate	Satellite installation and programming, CCTV installation and programming, advanced satellite networking, database management and solar installation
Success Institute College	Private	URR	N/A	N/A	N/A	N/A	IT – certificate and diploma level
Ensa Touray Computer and Information Technology Training Centre	Private	NBR	N/A	N/A	N/A		Full IT course, MS Office, computer hardware repair and maintenance, data management using SPSS. The centre also engages students with field data collection techniques.
African Information Technology Holdings Limited	Private	WBR	N/A	N/A	N/A		IT certificate and diploma level
Suna Institute of Science and Technology	Private	WBR	N/A	N/A	N/A		Offers programmes like IT – certificate and diploma, database, computer graphic design, web programming 101. Also offers scholarships to students graduating from grade 12.
Start Now	Private	WBR	N/A	N/A	N/A		Trains and empowers virtually impaired secondary graduates on computer skills and rehabilitation techniques as a preparation for higher education and employment.
NGOs							
YMCA Computer Training Centre and Digital Studio*	NGO	KMC	573 (42%)	6 full time and 5 part time	8 weeks		Computer literacy and information technology, software application, web authoring, desktop publishing, IT support, multimedia, filming and video editing, and sound and music production
Give1Project	NGO	KMC	N/A (100%)		N/A		Focus on ICT capacity training for girls, and civic and entrepreneur skill development. Also trains and empowers youths in agriculture and has a garden in Kafuta, WCR. The project also won the AFRINIC Fire Award and Africa Google Code Week.
Tech centre							
Jokkolabs Banjul	NGO	KMC	N/A	N/A			Open innovation ecosystem and a virtual cluster for a social change based on an organic entrepreneur community and a network of innovation centres. Jokkolabs Banjul is also the host of Google Developers Group Banjul.
Community-based							
Balal Rural Empowerment Sustainable Development Initiative		LRR	N/A	N/A			Provide free training to students on basic IT, cyber security, web development, computer repair and maintenance. The initiative has also provided cyber security training for security personnel like police, immigration and PIU.
Rural Community Information Centre		LRR	N/A	N/A			The centre was established with support from MOICI to enhance access to information. It offers services such as printing, photocopying, laminating, and Internet café at 10 GMD for one hour.

* TVET was interviewed as part of ITC TVET mapping



Photo: ITC

TVET analysis

During the consultative process that led to the design of the Youth and Trade ICT Roadmap, ITC carried out a survey among TVET institutions in order to assess the overall performance of the TVET system and to identify bottlenecks. The survey covered a sample of 25 TVET providers and the University of The Gambia, out of which 12 provide ICT-related subject matter.

There is a wide offering in ICT-related subject matter within Gambian TVET institutions compared to the actual size of the sector. Graduates from private TVET represent the largest share compared to graduates from public TVET and the university. This is owing to the fact that the sector development is fairly recent and the public institutional framework has struggled to adjust to the fast-paced technological evolution while delivering quality training, but also because there is a large demand stemming from the youth to be trained in ICT, equally in the rural or urban areas.

The TVET survey highlights positive progress in a number of areas, compared to the previous assessments carried out in 2010, notably by the World Bank. These areas are detailed below:

- **The majority of ICT training providers have reported a significant increase in total trainee enrolment over the past five years** (approximately 30%), which demonstrates the young generation's growing interest in the sector. Indeed, the very low level of computer literacy, especially in rural areas, creates an appetite for basic ICT skills. This is the reason that regional TVET institutions do not provide courses other than basic computer literacy. The University of The Gambia and Microtech Institute of

Multimedia & Technology seem to be the ICT-education providers to have experienced the highest growth, as their focus is oriented toward a more advanced level.

- **Links between TVET and the ICT private sector are well developed and effective.** All of the training institutions providing ICT courses have reported interaction with the local private sector. This interaction goes both ways. On the private sector side, apprenticeships or internships positions are offered to trainees, and through technical assistance or technical training companies can gain access to specific expertise delivered by TVET. It is important to highlight that all TVET report providing internships or apprenticeships schemes (besides Microtech Institute of Multimedia & Technology).
- **Widespread geographical dispersion of ICT-based training providers throughout the country:** Licensed training institutions focusing on only IT user skills, which provides basic computer literacy, are covering all local government areas (LGAs) in the country. It is important to stress that advanced ICT courses are only available in Kanifing and Brikama areas, which is in line with the concentration of the population and economic activity around the coastal area.
- **Access to ICT education for girls and women is better than in other sectors, but could be improved:** Girls represent a significant proportion of ICT students (based on the TVET mapping, they represent approximately 40%). Few TVET provide incentive measures to encourage young women to study ICT, among which GTTI and Smart Technologies offer respectively 30% and 50% discount on tuitions fees for female students. Insight Training Centre provides scholarships to young women.
- **The majority of ICT institutions report that their staff members possess the appropriate qualifications and**

experience to teach the courses assigned to them. Institutions also claim to provide capacity building courses to their staff. This is a very positive sign compared to the situation with other TVET.

- **The course content of the majority of the ICT TVET is revised annually**, which demonstrates the dynamism of the TVET management to adapt to the constant change of technology, also taking into account TVET policy changes, the market demand and student preferences.
- **E-learning is widely used by TVET**: In terms of teaching methods, surveyed institutions report using various formats such as weekly classes, workshops, experiments and group discussions. It is important to highlight that 75% of surveyed TVET have initiated online teaching methods through e-learning or mobile-based platforms.

Collaboration among TVET is common practice: Two-thirds of ICT TVET report to have formal partnerships or other collaboration mechanisms with local TVET institutions. This collaboration is usually geared toward curriculum design consultation, sharing teaching resources or knowledge exchange and best practices. This type of partnership is also developed with other regional and international training institutions, but it seems limited to public institutions such as UTG and GTTI. Only a few private TVET have formal partnerships unless it is accreditations such as Microsoft or ABMA. Another positive sign during the design of the ICT roadmap was the private sector engagement to design a new Gambia Skills Qualifications Framework (GSQF) under the leadership of the National Accreditation and Quality Assurance Authority (NAQAA).

The TVET survey has also identified two major gaps:

- **Half of the TVET report lacking the necessary equipment and material for teaching ICT courses**. During the regional consultations, several ICT trainers complained about the old computers in the training centres, frequent power cuts and the absence of quality maintenance.
- **Absence of impact assessment and quality assurance**: Although TVET in ICT show positive and encouraging signs of development, it is important to highlight that none of the surveyed institutions conduct tracer studies to follow up on their graduates. The lack of tracer studies has been identified by many previous reports as a major issue affecting impact assessment of the TVET system. Efforts need to be made to support the introduction of system-wide tracer studies that would be administered across training institutions under NAQAA's authority. Given their nature, TVET in ICT sector should be leading on this front and assist in the development and piloting of systems.

Additionally, members of the ICT sector core team involved in the design of the roadmap have reported the absence of a quality framework to certify the levels of diploma provided by TVET. The private sector complains about the wide disparity of the competency level of graduates between training institutions. The sector association ITAG could help gather small and medium-sized

enterprises' specific concerns and channel the information back to NAQAA to take appropriate measures.

Additionally, the ITC field study and interviews with private companies and trainees have highlighted **additional shortcomings that come as a consequence of the major gaps describe above**:

- The quality of the sessions varies a lot, depending on the trainers and their commitments.
- Most capacity building sessions are not integrated in a curriculum with different levels and a skill objective, but are apparently more randomly organized.
- Most companies hiring people with ICT profiles do not trust formal, vocational or professional training organizations, and train their own staff before employing them.
- There is almost no training in latest technologies from mobile technologies, for example Internet of Things (IoT), open data or drones.

Compared to the rest of the TVET, training institutions providing ICT-related courses are delivering better services on several aspects. These include a relative widespread access to basic ICT courses focusing on computer literacy and a relatively important proportion of girls in ICT education compared to other sectors, although greater incentives could be developed to achieve equal access. Given the appeal among youth, especially in rural areas, where computer literacy is extremely low, TVET offerings in ICT-related courses, especially for basic ICT skills or well advanced, have experienced a sustained enrolment growth over the last five years.

A key characteristic of TVET in the ICT sector is their close relationship with the private sector. Both benefit from mutual benefits, on one side the provision of apprenticeship and internship positions and on the other side the access to specific expertise through workshops.

The major gaps, in line with all previous assessments of TVET delivery in The Gambia, exist in the lack of a structured curriculum oriented in progressive skills development, absence of training in latest technologies (IoT or open data), limited improvements in monitoring and impact assessment through tracer studies.

In order to pre-empt the development of the ICT sector, NAQAA and the sector association have to work together to establish a stronger quality assurance framework to better answer to the need of the industry and improve the overall competency level of the graduates.



Photo: ITC

INNOVATION ECOSYSTEMS AND ENTREPRENEURSHIP SUPPORT SERVICES

The innovation ecosystem in the context of this roadmap relates to the start-up scene in the country and related support services. ITC has carried out a field assessment to understand the existing level of development of new ICT companies in The Gambia.

Absence of innovative start-ups in the ICT sector

No Gambian examples have been identified in the various international studies or competitions in the African start-up scene (see for example 100 Innovations for sustainable development,¹⁹ Africa's Most Promising Young Entrepreneurs: Forbes Africa's 30 under 30 for 2015²⁰ or a 2014 study on mobile gaming²¹). In all these studies, entrepreneurs come from all over the African continent, including from countries such as Senegal, the Republic of Cameroon, the Republic of Kenya, the Republic of Rwanda, or South Africa, and also from the Republic of Mali, Sierra Leone or the Republic of Malawi, but none from The Gambia. There is no Gambian-funded start-up by any Africa-wide ICT funders like Venture Capital for Africa.²²

19.– <https://www.diplomatie.gouv.fr/en/french-foreign-policy/development-assistance/events/african-forum-100-innovations-for/latest-news/article/african-forum-100-innovations-for-18791>.

20.– <https://www.forbes.com/sites/kerryadolan/2015/06/12/africas-most-promising-young-entrepreneurs-forbes-africas-30-under-30-for-2015/#5046b3531de6>.

21.– http://public.sbc4d.com/2014/final_games_public.pdf.

22.– <https://vc4a.com/>.

The field research and interviews have only been able to identify entrepreneurs developing their companies for ICT consulting or ICT services in general. There are also individual consultants, but none have developed their company around new innovative products like mobile applications or the like. The only identified initiative is the very recent (29 November 2017) Innovate Gambia,²³ launched by an entrepreneur, and that is just an informal gathering for now, though the website announces plans for a co-working space, an initiative on women in tech and entrepreneurship and an investment fund. It will be important to see how this will develop.

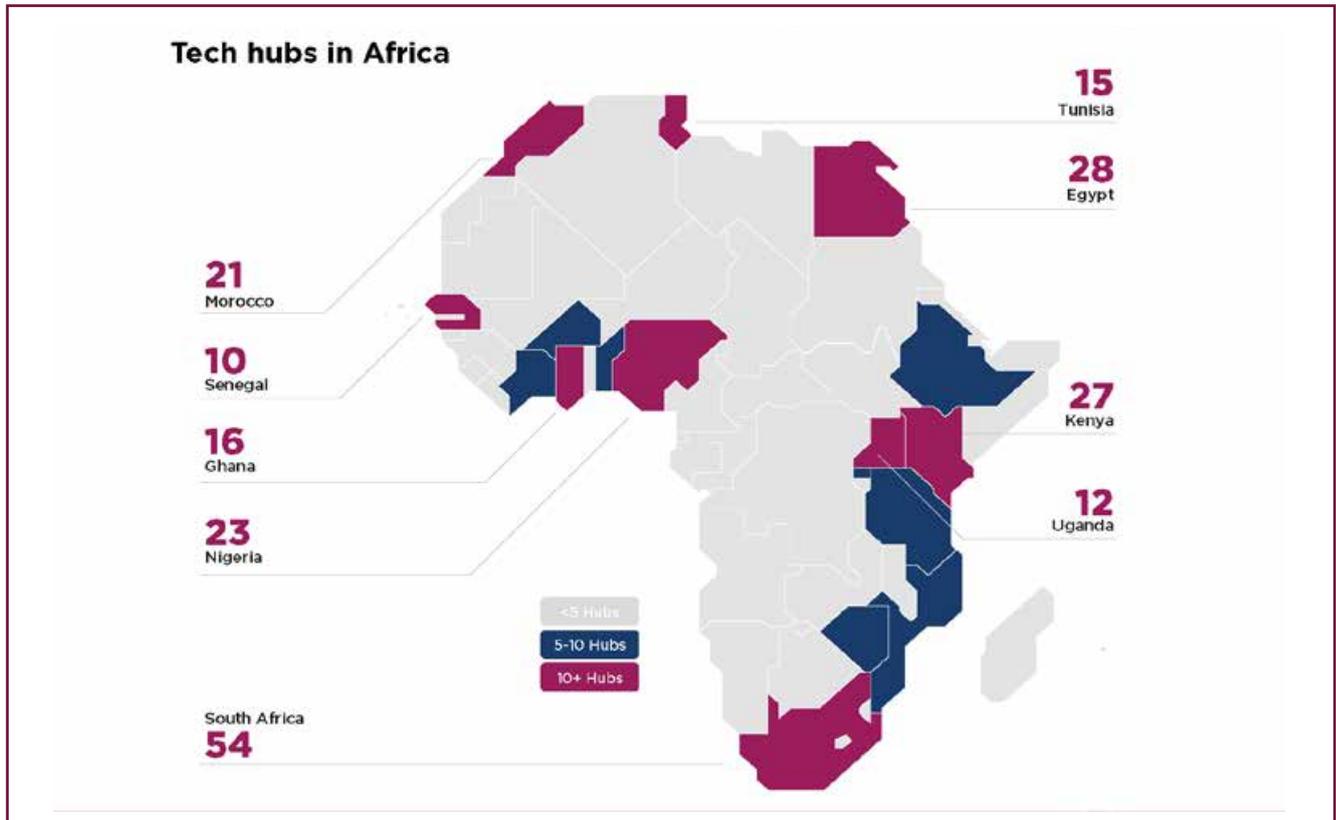
Absence of technology hub

There is no highly visible technology hub that helps structure the community, is a natural counterpart for the government when discussing ICT policies, for example, and provides a series of integrated services for both the community at large and individual innovators. There is only one embryonic tech hub, Jokkolabs, hosted by the YMCA. Jokkolabs works at a very low scale with very limited capacities. The entrepreneur community lacks a specific space to meet regularly like in the traditional tech hub in other countries. This limits the ability of young entrepreneurs to play an advocacy role in the development of new policy and design of support activities.

It is interesting to compare with the situation in Senegal and the rest of Africa. The map in figure 16 shows the tech hubs and their locations on the African continent. There are 10 active tech hubs, with some of them well known at the international level, like CTIC, Jokkolabs or Jjiguenne, and active in the policy dialog with the Senegalese Government.

23.– <http://innovategambia.com>.

Figure 16: Tech hubs in Africa



Source: GSMA.

Limited entrepreneurship programmes support

The TVET survey demonstrates that entrepreneurship education appears to be quite limited among training institutions providing ICT-related courses. Less than half of them integrate at least some form of training on entrepreneurship as part of their curriculum. This is even lower in the case of private TVET.

Based on the sector consultations, the access to entrepreneurship sensitization and business incubations support in the ICT sector is mainly provided by the Empretec programme and only a few incubators, among which is Start-Up Incubator Gambia, which assists young people through the steps required to set up a personal business. However, this type of support focuses mainly on business skills and is not specialized in ICT. There is the need to develop ICT-specific entrepreneurship programmes.

Empretec is a capacity building project for MSMEs, managed and implemented by GIEPA and supported by the United Nations Conference on Trade and Development (UNCTAD). Empretec mainly provides courses in the area of soft skills for entrepreneurship. There is no specific entrepreneurship programme for the ICT sector. Empretec has been running for three years and has successfully graduated a large number of students (as much as 2,000 in 2016 alone) and 120 business development advisors, and provided

business development services to 450 businesses, while UNCTAD certified 12 trainers as national trainers. The major issue is that the programme ended in 2017. It is critical that funds are secured for its renewal. Empretec Gambia has great potential for positive impact throughout the country. Scaling up the programme could facilitate the integration of entrepreneurship training in non-formal education.

Startup Incubator Gambia (SIG) was established in 2015 as a project funded by the United States Embassy and The Gambian-American Chamber of Commerce. SIG supports existing business through technical advice, mentoring and development support. Supported sectors include fashion, ICT, construction and hospitality. The Startup Incubator Centre provides co-working space for young entrepreneurs, with cubicles, computers, high-speed Internet, printing and a fully equipped training room with a capacity of 25 participants. Seven ICT entrepreneurs have passed through the training and one ICT entrepreneur is currently undergoing our training. SIG has also supported access to finance. The ITC CUBED report emphasizes the high-level commitment and understanding of the SIG team to support young entrepreneurs. However, SIG is constrained by its current project status. As with Empretec, SIG's funding came to end in 2017. The management is still testing its business model to become fully financially sustainable and autonomous, which would consolidate its achievements.



Photo: developlocal.org/

THE WAY FORWARD: YOUTH EMPLOYMENT OPPORTUNITIES IN ICT

The ICT sector possesses significant potential to impart socioeconomic contributions to The Gambia through domestic market growth and provides economic opportunities for the youth. In order to realize this potential, competitiveness

constraints and structural deficiencies will be addressed and identified opportunities will be leveraged.

The following is a delineation of the proposed vision and strategic approach in this direction.

THE VISION

Stakeholders engaged throughout the roadmap design process have agreed on the following vision statement:

“ Enhancing business growth with information technology and youth innovation. ”

STRATEGIC OBJECTIVES FOR YOUTH EMPOWERMENT

The vision set-up for the roadmap is delineated in four strategic objectives built around the key areas where action is required over the next five years. The plan of action (PoA)

detailed on page 61 will respond to this vision by addressing the sector's constraints while leveraging economic opportunities for the youth in a comprehensive manner.

1. Strengthen sector coordination and regulations	• The first objective focuses on creating an enabling business environment to stimulate sector growth, through better coordination, regulation and quality assurance.
2. Improve the quality and relevance of ICT skills development programmes	• The second objective concentrates on skills improvement, both through the upgrade of technical training to fill the skill gap and through support to TVET institutions.
3. Improve MSME productive capacities and market linkages	• The third objective focuses on cooperation, upskilling and innovation among young entrepreneurs to capture business opportunities in the digitization needs of the public sector and in cross-sector synergies.
4. Foster e-entrepreneurship and business growth in the ICT sector	• The last objective focuses on building entrepreneurship and business support services for young ICT entrepreneurs and improving access to finance.

KEY SUCCESS FACTORS

For this roadmap to have the maximum impact and to achieve all goals that were set, a number of key success factors need to be in place. These are:

- **Political and leadership:** The government needs to have an ICT policy to guide the provision and usage of ICTs. It is difficult to record progress in the absence of clear milestones set in such a policy.
- **Sociocultural:** This encompasses the language barriers in English in rural population that may prevent basic understanding of ICT concepts.
- **Infrastructural:** The success of ICT greatly depends on good infrastructure that enables the availability of and accessibility to ICT. Power access is a particularly key aspect in this regard.
- **Technical:** This refers to technological factors, which include network reception, Internet connection availability and system integration, etc.
- **Educational and skills:** This mostly refers to the human capacity to understand, use and manage ICTs.
- **Economical:** This refers to the affordability of the use of ICT for the population based on the per capita income, including costs of ICT equipment, services and networks.
- **Security and safety:** This refers to the overall safety conditions in the country and the freedom from danger to use ICT-based services.
- **Legal and regulatory:** This refers to the regulations in place in the country that need to provide sufficient space for the sector to develop, while covering key associated areas such as cybersecurity.



Photo: (CC BY-NC 2.0) IIP Campaigns & Initiatives

LEVERAGING OPPORTUNITIES FOR YOUTH IN THE ICT SECTOR

ICT INDUSTRY PERSPECTIVES

The ICT industry worldwide is a vast, fast-growing sector. Communications represent more than half of the industry, but software and other ICT services account for well in excess of \$1 trillion globally.²⁴

Governments and businesses account for approximately two-thirds of the industry's clientele, with consumers taking up the remaining third. **All sectors of the economy are ICT customers.** However, some sectors, including financial and business services and government, stand out as major consumers of ICT services. From this follows potential or actual linkages between the ICT sector and other industries that

are of relevance for strategic development at the business, sector and national societal levels. There are significant differences in the relative importance of communications, software and other ICT services between the various client sectors.

The ICT sector represented 6% of global GDP in 2010²⁵ and that share is expected to reach 8.7% by 2020. The growing importance of ICT is inter alia reflected in the increasing number of ICT companies that have among the largest market capitalization in the world (Apple, Microsoft, Google, IBM, Samsung, Oracle, Intel and Amazon, etc.). The ICT sector has become the engine of the world economy.

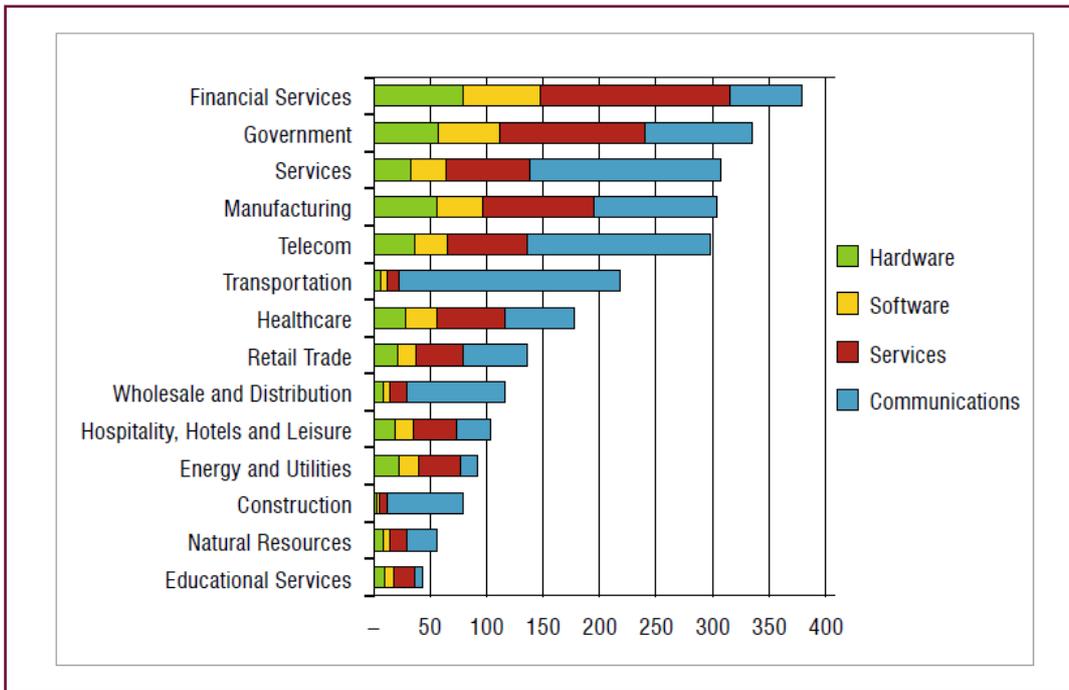
24.– Gartner, 2016, accessed from: <http://www.gartner.com/newsroom/id/3482917>.

25.– R.D. Atkinson, L.A. Stewart, *Just the Facts: The Economic Benefits of Information and Communication Technology*, Information Technology and Innovation Foundation, Washington DC, 2013

Figure 17 reflects not only the significant volume of spending on ICT, but also the spread of the industry's clients across the entire economic spectrum. This spread reflects not only customers and, hence, markets, but simultaneously also

opportunities for synergies and linkages, as other industries can act as cooperation partners for the development of joint products, for marketing clusters and for joint branding initiatives, to name just a few.

Figure 17: Worldwide business spending on ICT by sector (USD billions), 2009

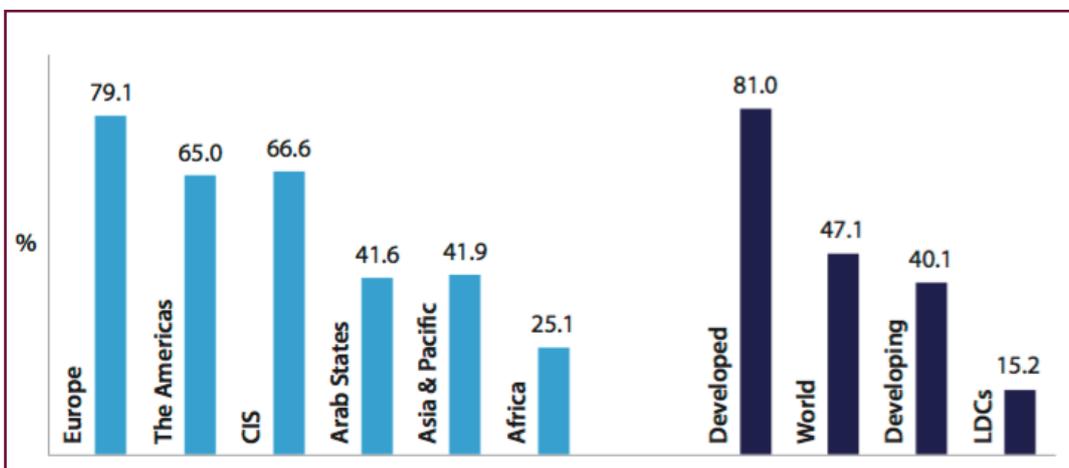


Source: World Information Technology and Services Alliance (WITSA) (June 2010). Digital Planet 2010.

However, the ICT sector does not develop evenly among the developed and developing world. The so-called digital divide appears very clearly when comparing Internet

availability among different regions of the world, as shown in figure 18. Availability of the Internet and mobile networks are first indicators of the capacity to engage in the sector.

Figure 18: Percentage of individuals using the Internet, by region and category



Source: ITU, ICT facts and figures, 2016.

With this in mind, it is essential for The Gambia to take action to be able to diversify its ICT sector beyond Internet and mobile access providers. Successful experiences from other African countries can be used as examples to replicate pilot projects in The Gambia, such as:

- **Kenya:** In Kenya, ICT is used in the field of new educative approach and innovative transaction methods. The firm Eneza Education provides mobile technology based education services with more than 1.8 million learners across Africa. The M-Pesa digital payment system is another well-known example of an initiative that creates additional income for more than 80,000 persons.
- **Rwanda:** Like many African countries, Rwanda faces gaps in electricity infrastructure coverage in remote rural areas. The Mobile Communications Project enables special ICT transport buses providing Internet access in remote rural areas that face a lack of electricity and infrastructure required to enable Internet access.
- **Uganda:** In Uganda, ICT is used in the field of medicine. A tech start-up called Matibabu is developing a non-invasive malaria detection application for smartphones that uses a light sensor finger pad to detect malaria in red blood cells.

POTENTIAL NEW MARKETS AND SERVICES AREAS

The ICT sector permeates society like few others, as it's linked to virtually every industry and body in a mutually reinforcing relationship, and thus can generate numerous synergies with public institutions as well as with other domestic sectors such as agriculture, education, tourism, finance or health. For this reason, The Gambia's ICT sector is considered one of the most promising in the country due to its untapped local demand, representing opportunities for business.

To ensure positive spillover effects with other sectors of the economy and to increase their productivity, it is essential that digital processes be embedded within economic transactions and processes. The Gambia's ICT sector has an increased potential to develop in the national market, especially by leveraging the wide mobile and Internet coverage available. Indeed, the low usage of mobile data due to high price could represent a significant opportunity for investors as soon as mobility data plans become more affordable. Additionally, as the ICT-enabled sectors will grow in the next years, a significant need for e-mail, security, data back-up and website services or business process outsourcing (BPO) will arise in both the public and private sectors.

The following are some of the proposed new service areas that entail an important demand for digitalization and would represent large benefits for the country's overall competitiveness.

Leveraging specific potential cross-sector synergies

Potential linkages have been identified in the course of the roadmap design process in the context of agriculture and tourism. Various shortfalls in these two sectors could be addressed through ICT solutions. For instance, improving web marketing of tourism operators, digitizing archives of public institutions, developing e-government initiatives and improving overall access to finance through the development of mobile money.

ICT and agriculture

Agriculture is one of the leading economic activities in The Gambia and new technologies could particularly serve to modernize this sector. In particular, the use of smartphones through basic phone applications, such as smartphone apps or voice-based services, or the trend is now on smart-agriculture or precision agriculture using latest technologies such as drones or Internet of Things (IoT), including:

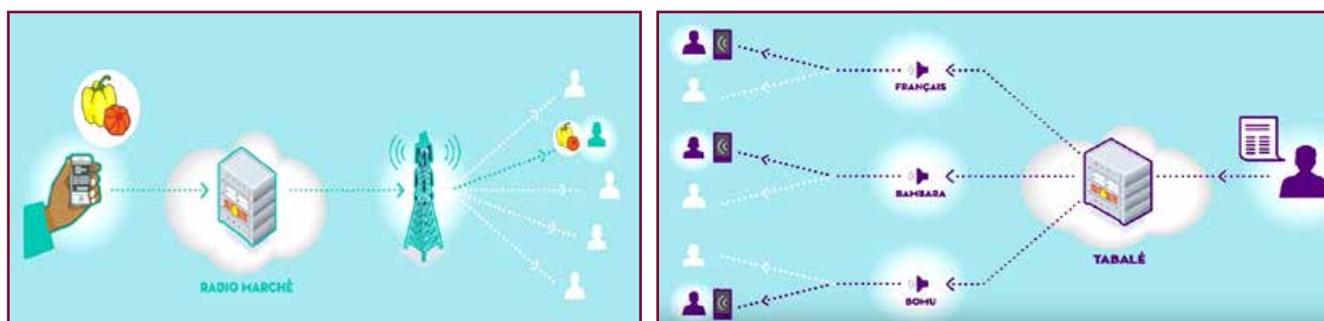
- **Improving communication between value chain actors with Web 2.0 and social media** allows development actors to easily communicate with peers and other stakeholders, strengthen their networks, selectively access information, produce and publish their own content or redistribute content published by others.
- **Mobile apps for agriculture** play an important role in connecting different nodes and supporting actors along value chains to make informed decisions.
 - For instance, this smartphone app facilitates real-time data collection during harvest periods for all crop types, including information about exact location, quantity, quality and price. The information is then stored in searchable databases. On one hand, this would assist the public technical agencies and sector associations to improve their assessment of the sector performance and, on the other hand, potential buyers could contact farmers directly and better plan their supply chain routes. This potentially minimizes waste and products would be sold at a fairer price as a result of mobile technology coordinating the supply and demand. Smartphones can be used to stimulate the development of mobile phone-enabled agriculture information and advisory services that are commercially sustainable.
- **Participatory spatial information management and communication** is extremely effective in giving a voice and authority to grassroots concerns and aspirations related to spatially defined issues, such as climate change adaptation, land use planning and land tenure. The adoption of such practices, coupled with acquired skills in using social media, has enabled grassroots communities to add value and authority to their local knowledge and to 'have a voice' in policy processes.

- **Unmanned aerial vehicles (UAVs)**, better known as drones, are a new emerging technology that could revolutionize the way agricultural entrepreneurs interact with the land, water, crops and infrastructure.
- **Voice-based services:** The voice service is the use of call centre technology to provide users with expert advice and automated voice services. Farmers can call and get information and guidance on policy, technology, marketing, business or other relevant professional and social information.

For instance, in Mali²⁶, voice services have been developed to disseminate market information between producers and traders from a text message to radio broadcasting, e-mail or converting a text message into a voice message in different languages, including local languages.

26.– SMS vocal – https://youtu.be/7TKW3ojS5Pg?list=PLcKpjPWYkBe_Ez3oFK6E1wjCBnkwEiVVe.

Figure 19: Examples of voice-based services



Source: 100 innovations pour un développement durable pour l'Afrique²⁷ – Agence Française de Développement.

27.– SMS vocal – https://youtu.be/7TKW3ojS5Pg?list=PLcKpjPWYkBe_Ez3oFK6E1wjCBnkwEiVVe.

ICT and tourism

ICTs and principally the Internet have revolutionized the tourism sector. It is almost impossible to imagine touristic development projects without considering the major role of ICTs. Many countries have succeeded in using ICTs and, more precisely, the Internet to develop their tourism industries. The Internet has facilitated prospective tourist and current visitor services, communication and information access.

Touristic promotional activities through ICTs and especially the Internet are managed by governments and, in particular, businesses. Governments take necessary measures to encourage private sector organizations to play the role of promoters of their country as a touristic destination. In addition, web and social media help websites become more interactive. E-marketing strategies have to be developed to move from exclusively providing information on websites to enabling website visitors and social media visitors to participate and interact with the information provided. Tourism websites have to provide navigational assistance through the Internet through a wide range of communication tools such as maps, photographs and videos. Additionally, websites and social media pages have to be continuously updated in different languages in order to attract the maximum number of visitors from different countries, cultural backgrounds and educational backgrounds.

The trend is also on local smartphone apps for visitors, which provide a service or experience such as games (treasure hunting), maps for local services, cultural site visits or events. The next development is to move into 'smart tourism destinations' and 'smart tourism tools' providing tourists with an enhanced customer experience through personalized information based on quick information exchange such as smart notification, using latest technologies and tools such as QR codes or NFC tags, which provide links between the physical and digital world.²⁸

However, the first opportunities are related to the digitalization of tourism services and improving the web presence of The Gambia in existing specialized websites.

Microwork initiative

The Gambia has specific strengths that fit very well with the BPO sector, particularly for microwork. On one hand, the sector offers low to very low salaries compared to other neighbouring countries. On the other hand, the country has relatively good international Internet connectivity thanks to the ACE cable. These strengths should be exploited to develop the sector. At the time of the ITC field study, there

28.– <https://opendataincubator.eu/files/2016/06/Smart-Technologies-in-Tourism.pdf>.

was no microwork initiative in the country and, based on the analysis in other countries, it seems to present a series of opportunities.²⁹

1. Microwork is a very efficient way to train youth on ICT from basic tasks to more complex ones as they develop their skills. These approaches not only give jobs to youth, but also enable them to access new, more qualified opportunities. The objective is not to get a stable job, but to use the approach to grow the number of professionals in the ICT sector.
2. There is a specific need identified within the government (digitization of records) that particularly fits the microwork concept. The National Record Service (NRS) has the huge task of digitizing the records with 6,000 days of work already identified to digitize the documents they have internally, without even counting all documents in all other government agencies.

Such approaches will allow the country to test, at low cost and on a low scale, the potential of BPO and, depending on the result, expand it later. This model has been successful in other countries³⁰ as a way to train youth in ICT, support the government and initiate business process outsourcing (BPO) activities locally with the aim to expand outside the country later. One key element to note is the type of microworks that is applicable in the country. There are two main models for these platforms:

- **Individual-led approach:** Each individual subscribes to tasks online or on their mobile phone, and receives payments (mobile money, visa card payment or wire transfer). That's the model of microwork platforms like Jana or Amazon Mechanical Turk.
- **Entrepreneur-led approach:** An entrepreneur sets up a tech centre and contracts tasks that he or she splits among people in the centre (BPO model). People usually receives training before getting to the tasks. That's the model of platforms like Samasource.

Given the very low financial inclusion and limited penetration rate of mobile money,³¹ the individual-led approach does not seem to be a viable option. The only model that would be interesting to explore is the entrepreneur-led model, either through a partnership with an international microwork platform or as an independent organization targeting the local market.

- Based on ITC field study, the most appropriate strategy to develop this microwork and measure impact is not to subsidize specific microwork companies, but to support

29.– The only initiative reported, but not confirmed (to potentially start in January 2018), is a local project that has a partnership with CrowdFlower.

30.– See examples in Ghana: <http://blogs.worldbank.org/ic4d/big-steps-toward-ghana-s-digital-future> <https://www.rockefellerfoundation.org/about-us/news-media/rockefeller-foundations-3-8-million-grant-helps-position-ghana-to-accelerate-future-ict-job-growth/>.

31.– We were not able to get any official statistics of the penetration rate of mobile money, but this evaluation is based on the feedback from interviewees.

the development of their businesses by funding public agencies like the National Record Service (NRS) to digitize their documents. Such an approach will support the country by making data available in electronic format and easing its exploitation, and will simultaneously create market opportunities for microwork platforms to develop. This will not only create a demand in the sector, but will also serve as a shining example for other departments and agencies in the government. This will enable microwork companies to start businesses with a robust customer before expanding to other opportunities with an online microwork platform. Microwork companies should also be eligible for incentives like start-ups mentioned in the following section to support their set-up and development.

Finally, it may be interesting to consider integrating a microwork initiative within the tech hub (see next section about entrepreneurship). This will help the sustainability of the tech hub and support the community building, allowing people entering the microwork centre to be in contact with the innovation sector that offer opportunities, and benefit later from other tech hub services.

- Given the current situation, this roadmap seeks to promote and support the development of microwork in Banjul area, but consider expanding it later to main towns and regions to offer opportunities at the subnational level.

Digitalization to faster online transactions and online marketing

Besides the two pioneer companies targeting The Gambian diaspora, e-commerce is underdeveloped in the country. A new partnership with the Central Bank of The Gambia has been established in order to develop the first Gambian online payments company, Gamswitch Company Ltd. Given the very recent introduction of mobile money and the very low financial inclusion level in The Gambia (75% of the adult population in the country do not have bank accounts³²), the development of e-commerce is very likely going to be hindered by the lack of digital payment instruments. Furthermore, the lack of comprehensive address records can massively increase the number of delivery mistakes and delay packages from arriving at their correct destination.

It is important to note that this is not specific to The Gambia – the development of e-commerce (buying goods online) is very slow across the continent. Nevertheless, according to management consultancy McKinsey Company, e-commerce is expected to become big business in Africa, with the continent on track to generate yearly e-commerce sales of \$75 billion by 2025.³³

32.– <http://standard.gm/site/2016/04/13/financial-inclusion-key-policy-agenda-government-cbg-boss/>.

33.– <http://africanbusinessmagazine.com/region/west-africa/nigerias-e-commerce-infrastructure-challenge/>.

There is no quick fix that will see The Gambia's e-commerce infrastructure challenges resolved. The difficulties in developing a successful e-commerce ecosystem in The Gambia should not be downplayed, but the emerging e-commerce market has the potential to significantly increase the online visibility of Gambian products and services and noticeably improve business-to-business linkages. For this, the following steps would be required:

1. Digitization of SMEs and their products: Start with 10 to 15 SMEs. Train and equip trade support institutions with hardware, software and know-how. Focus on directory and business to business (B2B) e-commerce functionality to have a detailed catalogue of SMEs and their products in their current state (not necessarily for export or e-commerce, but for further analysis work and domestic B2B opportunities). This also includes advanced barcode and labels generation and printing tools for solving primary packaging issues.

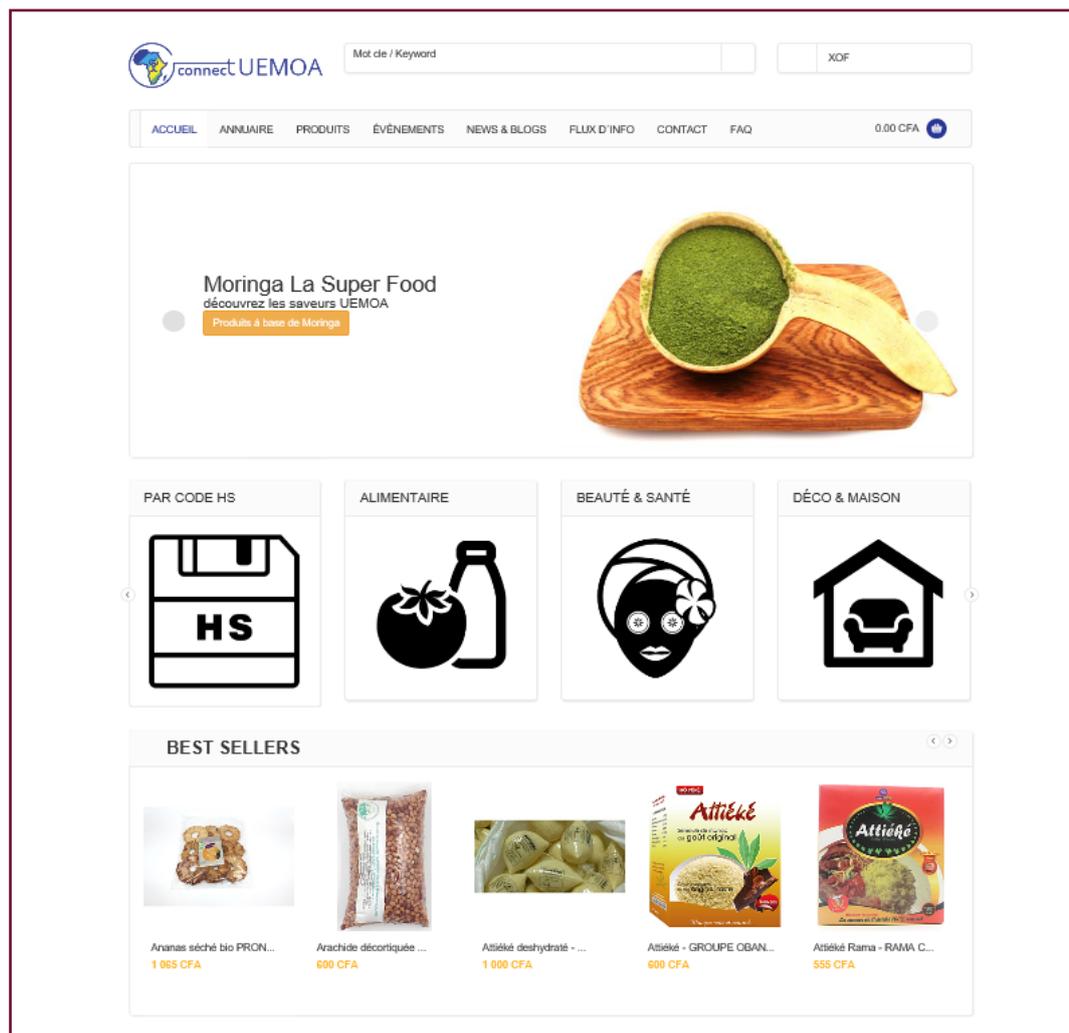
2. Extend functionalities of the online portal and train trade support institutions on news management, events management and other advanced functionalities.

3. Train the trainer approach to equip young talents with portable digitization studios so that they can travel to SMEs and digitize their story and their products and upload on the platform with supervision and quality control from trade support institutions or other partners.

Applications development

Developing apps for mobile phones specific to the needs of the country would also be an interesting new market, specifically in the fields of education or agriculture. Multinational corporations launched initiatives to invest in local start-ups in Africa, e.g. promoting local app development. However, the emergence of these apps is the result of the set-up of an ICT-enabling environment.

Figure 20: Digital marketplace



Note: Examples are: <https://connectuemoa.com> and <https://ecom.coop/shop> (ITC projects).

Box 2: Examples of apps in agriculture with potential in Africa*

Vet Africa: A Scotland-based tech company, Cojengo, in partnership with Microsoft, created Vet Africa. The app is popular in East Africa and is used to diagnose livestock disease and suggest suitable medications for farm animals. The app also helps farmers monitor and record animal data.

M-Farm: With more than 7,000 registered users, M-Farm updates farmers on current prices of goods across the country. It provides a networking platform to connect to other farmers in order to sell their goods in larger quantities. The app also connects local farmers directly to suppliers without middlemen and gives significant discounts on fertilizers and seeds.

Esoko: This app connects projects, non-governmental organizations (NGOs), businesses and government to farmers. Operating in nine countries across Africa, Esoko (formerly TradeNet) provides agricultural content, marketing, and advisory and monitoring services for farmers and potential investors.

KUZA Doctor: This app enables farmers to receive specific information on crop growth, soil and other general questions through SMS. Created by the Backpack farmers in Kenya, the app is supposed to help farmers grow better crops by employing environment-friendly techniques.

* <https://apps4ag.org/database/popular.html> and <http://venturesafrica.com/these-10-apps-will-boost-agriculture-in-africa/>.

Online working for foreign markets

The possibility of working online as a freelancer is a major consequence of the creation and diffusion of Internet. In the last 10 years, the amount of earnings from online freelance work is constantly growing. In 2009, less than \$500 million was earned through online work, while in 2014 the total was \$3.2 billion.³⁴ The prevalent sector for online work is technology, which covers 50% of online earnings, followed by administrative support and writing (12% each). In Africa, encouraging signs from the two of the leading online work platforms on the continent (oDesk and Elance) reported 2.5 million jobs posted on their platforms in 2012. That year, oDesk reported worker earnings of \$360 million, and a survey found that more than 60% of the service's Africa-based workers provide at least half of their families' income.³⁵

The skills that are experiencing the strongest rise of demand in job offers are the following:

- **QA testing** – the activity of measuring and examining quality and improving the software through process updates;
- **Video editing** – the manipulation and arrangement of video shots;
- **Online bookkeeping and accounting** – the use of specific software that manages invoicing, bank reconciliation, bookkeeping and more;
- **3D design** – the process of using software to create a mathematical representation of a three-dimensional object or shape;

- **Online customer relationship management (CRM) services** – innovative software used to manage customer relations; and
- **Source code management** – a system used to guarantee faster and higher-quality code changes.

These skills significantly increase the possibility of finding an online job and are acquirable online through specific courses and training. Many websites post job offers from different companies for online work, such as: Upwork (www.upwork.com), Freelancer (www.freelancer.com), Indeed (www.indeed.com) or Remote (www.remoteok.io).

Limited youth employment opportunities in ICT in rural areas

As described in the previous chapter, the use of IT and ICT is far lower than in the capital area. Very few businesses have computers and even fewer have an Internet connection. The demand for ICT services and ICT skills is thus very low, if not inexistent. At first glance and in the short term, the ground does not seem to be very fertile for the development of the ICT market in the rural areas.

This is also largely due to the very limited infrastructure such as Internet cafés and lack of capacities of existing ICT training centres in the regions. The main issue is related to electricity (absence and instability), which makes the operating of ICT centres almost impossible. Internet cafés have run out of business as people use their mobile phones to access their e-mails or communicate through WhatsApp.

34.– <http://elance-odesk.com/online-work-report-global>.

35.– <https://www.rockefellerfoundation.org/blog/online-work-new-frontier-digital-jobs/>.

Limited opportunities in mobile charging and mobile repairing kiosks

ITC field assessment explored mobile charging and mobile repairing opportunities³⁶ by interviewing individuals from local communities and existing mobile charging kiosks. The output gives a clear picture of the landscape. At the moment, while there are clear electricity problems all over the country, an ecosystem is already in place for those two services.

Concerning electricity, either the community is self-organized to charge phones (e.g. someone, as a rotating duty, collects all phones and goes to a place where there is electricity and charges them all), or there are already a few charging kiosk businesses. The only factor that is considered by people is the price. As soon as there is competition locally (multiple charging kiosks), the prices drop to GMD 5, making the business and the opportunity to make a decent income very difficult. It is very unlikely that the support of the development of these businesses would lead to increased opportunities for the operators; instead, it would likely make the opportunities less favourable for currently established actors. The investment in more advanced kiosks like the ones proposed by ARED (<http://www.a-r-e-d.com/>) or SOLARKIOSK (<http://solarkiosk.eu/product/>) as developed in a few countries in Africa does not seem to be relevant, as an ecosystem is already in place. Charging and airtime cards and alike are already available. Most kiosk solutions were deployed in the early days (2008–2012) as a way to expand the mobile phone penetration. However, now, in most countries, and in particular in The Gambia, given the penetration rate, the overall ecosystem cannot be significantly developed with the hope of creating a sizeable number of jobs.

The case of phone repairing is similar, but also slightly different. The need exists, as there are only a few people able to repair phones locally. However, an ecosystem also exists, where people are able to send their phones to bigger towns to get them repaired. The second main issue is that the market is limited. Most people have very basic phones in rural areas, and such phones are very cheap. Only a few have smartphones. The basic phones are not only more robust, but the type of repair is limited and occurs relatively rarely. The opportunities to create a job that can deliver a decent salary is low and is the main reason for its underdevelopment at local level. Finally, a few people mentioned that, once, they used to have someone repairing phones in their village, but when these persons were knowledgeable they usually migrated to the greater Banjul area to access more opportunities (larger market; smartphone market). For all these reasons, it is unlikely that this sector presents a strong business opportunity and a potential for job creation.

36.– Source: <https://www.rockefellerfoundation.org/blog/online-work-new-frontier-digital-jobs/>.



Photo: ITC

Limited opportunities in support services in rural areas

The provision of specific services such as internet kiosks, printing, photocopying, document editing and formatting are the only ICT-related businesses existing in the rural areas. Even there, business owners have reported struggling because of power shortages and use of mobile phone to communicate.

- As a first step, an awareness campaign about ICT opportunities could be a way to create an agent of changes in rural areas. As explained previously, an alternate complementary way to engage a new revolution could be the deployment of mobile ICT services to support main activities in the agriculture sector that could simultaneously demonstrate the potential of ICT tools, support the agriculture domain, and raise awareness among youth about ICT and innovation;
- Additionally, the efforts of building access to ICT basic skills training need to be reinforced and access expanded.

MARKET IDENTIFICATION AND INVESTMENT ATTRACTION

Mobile data access has broadened the national market for ICT firms. There are three types of national markets in which ICT companies can engage: the consumer market, private sector operators and the government. While the consumer market is an essential one for firms to increase their revenues, the private and public sectors also present interesting potential.

The following are some of the proposed new service areas that entail an important demand for digitalization and would represent large benefits for the country's overall competitiveness. These new market and service opportunities are, however, not equally achievable, as not all required conditions are in place. Table 8 provides a snapshot in terms of infrastructure and skills preconditions to engage in those new services.

Table 8: New market and product opportunities

ICT segments	Market	Potential new areas	Infrastructure	Skills gap
Internet access	Private sector	<ul style="list-style-type: none"> Hot spot broadband access in rural areas 		
Data management	Public sector	<ul style="list-style-type: none"> Microwork for document digitalization E-services for public institution: online administrative processes, taxes collection and public services Public monitoring, statistics and related data mining for policy studies Trade facilitation: customs procedures and visa application 		
Cloud	Public sector	<ul style="list-style-type: none"> Education (cloud-based availability of courses and content) 		
Software and app development	Private sector	<ul style="list-style-type: none"> Applications development (agriculture and tourism) 		
	Public sector	<ul style="list-style-type: none"> Application development in education 		
Hardware	Consumers	<ul style="list-style-type: none"> Maintenance, repair and deep repair 		
Transaction	Private sector	<ul style="list-style-type: none"> E-commerce (particularly targeting the diaspora) Online catalogue to promote B2B 		
	Consumers	<ul style="list-style-type: none"> Mobile money 		
Communication	Private sector	<ul style="list-style-type: none"> Agriculture: SMS-based systems to communicate information about the harvests Tourism: Web marketing and social media, tour reservations and local events, development of local multimedia content and e-marketing 		

Attracting foreign direct investment by developing linkages with the diaspora

It is also interesting to explore venture capital (VC) investment. While we have identified any VC investment in start-ups in The Gambia during the field study, it is important to mention that venture capital investment is literally exploding.

SKILLS NEEDED TO SUPPORT SECTOR DEVELOPMENT

After mapping out the training providers in the ICT sector and assessing the skills gap based on the results of the SMECS survey (see occupational skills gap at the sector level), it was essential to discuss the results with the private sector and compare the findings with the experience of ICT business managers in finding qualified candidates in specific positions. Thus, during the sector consultations in June 2017 and then in the following ICT sector core team meetings, new assessments were carried out for a list of typical ICT occupations to further identify the issues encountered during the recruitment, to list the training institutes currently providing the required education to fill the gap, and, finally, the type of training needed to improve the competency level. A summary of all findings is presented in table 9.

The main occupations for which firms encounter difficulties to fill positions are the following, by level of qualification required to fill these positions:

- **High required level of qualification**
 - » Software and multimedia developers and analysts
 - » Database specialists
 - » ICT network (system administrator) and hardware professionals
 - » Telecommunication engineers.
- **Average required level of qualification**
 - » Content technicians for web
 - » Applications development and testing technicians
 - » Electronics and telecommunications installers and repairers.
- **Low required level of qualification**
 - » ICT operations and user support technicians.

Most of these skills are key for engagement in the new market and services opportunities that were identified in the previous section. In this regard, these skills gaps represent real bottlenecks for further development of the sector. Developing skills being a mid- to long-term endeavour, it is imperative to initiate action on this now to perceive effects in the upcoming years.

For all of the above specializations, there are very limited or non-existent courses provided by TVET institutions. For the average and low qualification positions, it would be an easy addition to existing programmes delivered by certain training providers such as YMCA or QIT. For higher-level qualifications, UTG is in the process to integrate new BScs on software engineering, telecommunication and wireless technologies and communications and media.

Short- to mid-term training programmes of 1–6 months, focused solely on these skills, need to be developed and integrated in major TVET institutions. Once the tech centre is set up, companies will be able to collaborate further on these topics.

Table 9: Skills gap assessment in the ICT sector by typical occupation and type of new courses needed

Occupation	Average level of competency	Difficulty in filling such position	Job opportunities for youth	Issues encountered during recruitment	Educational institution(s) currently providing this education or training	Type of training needed
Manager						
Information technology and telecommunications directors	Competent	No	Average	Not enough experience, lack of soft skills	Consultant trainers, UTG, MDI, QIT, GTTI	ICT leadership training, MBA/MSC
Professional						
Software and multimedia developers and analysts	Average	Difficult	Yes	Lack of technical competency, experience	YMCA, University for Software, GTMI, GTTI, MDI	Multimedia training, software development courses
Database specialists	Competent	Difficult, not common	Yes	Lack of hard skills, lack of interpersonal skills and communication/PR	Nifty, Ace Communication (Microsoft Imagine Academy) (once a year with foreign specialist – 80)	Advanced courses
Systems administrators	Competent	No	Yes	Lack of hard skills, lack of interpersonal skills and communication / PR	Through Microsoft, MDI, Lasting Solutions	Non-Microsoft – Oracle/HP/IBM
ICT network (system administrator) and hardware professionals	Competent	Difficult	Yes	Lack of hard skills and employers	No provider identified	Advanced courses
Telecommunication engineer	Competent	Difficult	Yes, but limited number	Incompetent in telecommunication, outsource	In-house training should be done (Gamcell is the only one)	Regulation
Technicians and associated professionals						
ICT operations and user support technicians	Average	Difficult	Yes	Lack of experienced applicants, lack advertisement of vacancies	MDI	Service delivery training required
Web technicians	Average	No	Yes	Static website is okay, lack of technical competencies and hard skills	YMCA, UTG Nifty	More training programme web technology, NET/Php
Content technicians for web	Not present yet in the sector	Not present yet in the sector	High opportunity	Occupation is not present in the sector	No provider identified	Content management, multimedia
Applications development and testing technicians	Incompetent	Difficult	Yes	Lack of technical skills	INSIST Academy, Tech Solution and Nifty	Need for ICT incubator
Broadcast technicians	Average	No	Yes, but limited number	TV: 1 station Radios: a lot Lack of exposure and technical skills	No provider identified	On-the-job training and scholarship to study abroad
Electronics and telecommunications installers and repairers	Incompetent	Difficult	Yes	Installation company: non-existent	Informal training GTMI (Gamtel)	Unique solutions
Clerical support workers						
Administrative, clerical and accounting workers	Competent	No	Yes	Lack of experience	MDI	No need
Sales workers						
Personal services workers	Competent	No	Yes	Lack of hard and soft skills and experience	No provider identified	Lack of good training in sales
Shop salespersons	Incompetent	No	Yes	No issue	Business training, sales and marketing, on-the-job training	Lack of good training in sales
Elementary occupations						
Street and related sales and services workers	Average	No	Yes	Lack of capital presentation skills	No provider identified	Open sales and marketing training for businesses

Note: Most-needed occupations are highlighted in blue.

REINFORCING TVET AND CREATING A TECH HUB TO SUPPORT E-ENTREPRENEURS

The Gambia's ICT sector faces serious issues concerning its advanced ICT skills development capacities and absence of sector-specific entrepreneurship support. The roadmap is geared at upgrading the level of ICT courses while building up TVET capacities and developing support services for e-entrepreneurs.

UPGRADE THE LEVEL OF ICT COURSES OFFERING AND BUILD UP TVET CAPACITIES

The ICT sector in The Gambia faces serious issues concerning its skills development capacities with **limited range and scale of the offer for ICT-related training and education**. The major gaps exist in the lack of a structured curriculum oriented in progressive skills development, absence of training in latest technologies (IoT or open data), limited improvements in monitoring and impact assessment through tracer studies.

At the institutional level, the following improvement are required in addition to the integration of new training programmes:

Improve the coordination mechanism for the development of quality training in ICT

- Support the development of inter-ministerial coordination arrangements for skills development in ICT – establish a working group composed of public, private and TVET through the ICT Board
- Establish an ICT education provider working group. The group will have the responsibility of promoting national development of skill standards, common curriculum, learning materials and teacher training programmes with the involvement of all TVET providers and industry
- Update in The Gambia Skills Qualifications Framework (GSQF) for ICT and develop a quality insurance mechanism to certify training providers and their courses
 - » Integrate tracer studies mechanism in TVET management: Train management to carry out tracer studies for all trainees
- Improve impact assessment and quality assurance mechanism
 - » TVET and universities have to establish tracer studies mechanisms. Efforts need to be made to support the introduction of systems-wide tracer studies that would be administered across training institutions under NAQAA's authority
 - » Upgrade the level of TVET by reaching international certification, such as ITU Centres of Excellence (see box 3).

Box 3: ICT certifications

Following the constant and sustained growth of the use of information and communication technology in every economic sector, the need for official certifications for the skills related to the sector has slowly emerged. Thus, many companies and institutions are now providing accreditations for the different skills demanded in the market. From Adobe to Apple, from Microsoft to Oracle, many companies are ready to offer training and the relative certifications, covering almost every skill and offering a wide range of prices.

Adobe: It offers a wide range of certifications for all its products, from Adobe Experience Manager Mobile to Adobe Analytics.

Adtran: Specialises in connection systems, as Wi-Fi or NetVanta routers.

Autodesk: The Autodesk Certified Professional (ACP) recognizes strong design software skills, as proficiency in AutoCAD, Inventor, Revit, Maya and 3DS Max.

Apple: The company offers certification of iOS experts regarding security or deployment, in order to become an Apple-certified professional.

Cisco: Cisco's offering is wide, with five levels of network certification: Entry, Associate, Professional, Expert and Architect, the highest level of accreditation within the Cisco Career Certification programme. The topics covered are routing and switching, design, network security, wireless, voice, data centre, storage, networking and service provider.

Box 3: ICT certifications (cont.)

CompTIA: As in the case of Cisco, the certifications have different knowledge standards, from entry-level to experts. The categories of certifications are: core, infrastructure, cybersecurity and additional professional.

IBM: It provides 248 different types of certifications, covering global financing, cloud, cognitive solutions and much more.

Microsoft: Microsoft offers multiple certifications, based on three levels of knowledge: Technology Associate (MTA), Solutions Associate (MCSA) and Solutions Expert (MCSE). The topics covered are mobility, cloud, productivity, data, app builder and business.

Nokia: It is possible to receive a certification for service routing, becoming a certified technical support professional.

Oracle: Oracle provides certifications on different aspects of ICT as applications, operating systems, database, java, cloud and virtualization.

The certifications above are only the most renowned ones, as the pool of institutions and companies that offer certifications is wider, depending on the prices and category of ICT. It is important to highlight that most of the courses needed for these certifications are online, offering different multimedia learning supports.

The prices vary from approximately \$200 for a CompTIA exam to approximately \$900 for an MCSE Microsoft certification, depending on the level of certification and the certifying company.

The certifications presented represent value addition for any ICT professional, providing an official proof of technical proficiency and solid knowledge of the certified topic, increasing the attractiveness of the ICT professional in the job market.

Strengthen the teaching capacities of the TVET

- Improve the equipment and material for teaching ICT courses
 - » Develop a funding mechanism to TVET to frequently renew their IT equipment
 - » Update the ICT training-related equipment at the UTG
- Build capacities of teachers in major ICT-related TVET institutions. Training should focus on incubator management, accelerator programmes, and monitoring and evaluation frameworks
 - » Develop academic exchange – create and implement a programme for academic exchange for university teachers
- Develop and update quality technical and vocation training programmes at certificate and diploma levels on:
 - » Software and multimedia development
 - » Applications development and testing, including new courses on voice-based services, IoT and drones
 - » Databases management and data analytics
- Complete curriculum with:
 - » ICT-related entrepreneurship courses have to incorporate in all TVET curriculum
- Develop short-term courses for technical and vocation training programmes on the following themes:
 - » Web content development
 - » Hardware, electronics and telecommunications installers and repairers
 - » ICT user support

- Develop soft skills courses in training programmes
 - » Support in organizing pitching investor events; marketing campaigns to recruit more students
 - » Integrate ICT leadership training and exposure to other technologies developed in African countries (Ghana; Kenya)
- Upgrade quality of diploma delivered by the University of The Gambia (UTG) on general computer sciences.

Develop ICT support student placement programmes for TVET

- Institutions graduating ICT professionals through apprenticeship and internship needed to increase graduates' prospects and the matching of industry needs with skills;
- Develop student placement at UTG;
- Formalize internship and apprenticeship positions with private companies.

Develop access to scholarship for advanced professional digital skills in partnership with local TVET (see box 3)

Many courses for digital skills learning and improvement are available online. The user can follow online classes and, in many cases, receive a certification at the end of the course as proof of the acquired skills. The teaching institutions are online universities or private learning platforms. The availability of these courses represents a benefit for

whoever wants to start a career in ICT. Starting from the basic skills, the user can increase the level of the courses, developing the skills required in the job market. The prices depend on the institution and on the level of the course: free courses are available, as well as flexible formulas of payment like monthly subscriptions or yearly fees. The range of available courses is wide as well: basic ICT skills,³⁷ software development,³⁸ design,³⁹ coding languages and typography.⁴⁰

37.– <http://www.avu.org/avuwweb/en/>.

38.– www.lynda.com and <https://www.coursera.org/>.

39.– <https://design.tutsplus.com/> and <https://www.udemy.com/introduction-to-graphic-design/>.

40.– <https://buscandotrazos.wordpress.com/2012/08/27/a-brief-introduction-to-typography/>.



Photo: ICT Training, ITC

Box 4: International Telecommunication Union (ITU) Centres of Excellence

ITU Centres of Excellence: In 1997, the International Telecommunication Union (ITU) created an innovative programme called Centres of Excellence (CoE), a human and institutional capacity building partnership between ITU, private sector companies in the telecommunications industry, development institutions and training institutions in the recipient regions. The centres are the focal point of each region in terms of education to professionals and executives, through in-person or distance learning programmes.

Every centre provides training and releases a certification as proof of the acquired skills. The training is usually fees-based, in order to achieve a self-sustained operational model.

Every macro region has three to six institutions that are part of the Centres of Excellence network, 30 worldwide, interacting among themselves and sharing expertise and know-how. The last CoE strategy identifies 11 priority areas for the training: policy and regulation, broadband access, cybersecurity, conformance and interoperability, spectrum management, digital broadcasting, ICT applications and services, emergency telecommunications, capacity building by Internet governance, e-waste, ICT, and climate change mitigation and adaptation.

There are six Centres of Excellence in Africa:

1. Ecole Supérieure Africaine des Technologies de l'Information et de la Communication (ESATIC), Côte d'Ivoire
2. African Advanced Level Telecommunications Institute (AFRALTI), Kenya

3. University of Rwanda, College of Science and Technology (URCST), Rwanda
4. Ecole Supérieure Multinationale des Télécommunications (ESMT), Senegal
5. Telkom Centre for Learning, South Africa

Institutions that want to become new Centres of Excellence will be required¹ to apply and demonstrate their competencies in the particular areas in which they want to be considered. Each centre may indicate interest in no more than two priority areas. The selection criteria are the expertise, recognition and competence in the priority area, the institutional quality and performance as a training institution in the priority area, and the proposal for implementation of CoE activities. If the institution is selected as a new CoE, it will be able to choose among four types of partnerships, each with different duties and benefits:

- CoE funding partner
- Content partner
- Academic partner
- Training delivery partner.

At the end of each World Telecommunication Development Conference cycle (2015–2018), all Centres of Excellence statuses will expire. However, they will be eligible for consideration as Centres of Excellence for the incoming cycle under the new strategy and procedures.

CREATE A TECH HUB TO SUPPORT E-ENTREPRENEURS

In order to foster development and innovation in the sector, it is essential to create a tech hub. This initiative will enable dialogue and exchanges among local ICT firms. This will foster collaboration between young developers and allow sharing of costs on R&D and personnel training. Potentially, micro and small companies will start collaborating to jointly market their services.

Set-up of a tech hub in Banjul area

For almost a decade and with the emergence of iHub in Kenya (<https://ihub.co.ke/>), the development of tech hubs all over Africa has been exponential. There are now almost 200 tech hubs across all African countries. The role of these centres is essential for the innovation ecosystem, because they perform critical tasks:

- **Community building:** Tech hubs' primary role is to offer a place where young techies meet and exchange ideas. This is instrumental to stimulate ideas and collaborations. The set-up of a community is also the first step towards other activities such as competition and hackathons, etc.
- **Entrepreneurship:** ICT centres' second role is to nurture entrepreneurs and young talent to support them until they reach a critical size. Different types of tech hubs have different objectives (see later in this section for details) in this area, but they all have some mentoring functions.
- **Awareness raising and capacity building:** Tech hubs' third key role is to raise awareness and build capacities in the community about latest technologies so that innovation can leverage the latest opportunities such as Internet of Things (IoT), drones or data science.
- **Linkages:** Tech hubs' fourth role is not only to convene young techies, but also to help create linkages with other actors:
 - » Organizations (NGOs, private sector and public sector) looking for solutions for their problem;
 - » International organizations, projects and initiatives looking for expertise and consulting;
 - » Foreign visitors to promote the local tech scene for e.g. investment.
- **Policy dialog:** Tech hubs' last main role is also to represent the community to engage with the government and advocate for specific policy interventions.

It is important to note that there are very different types of hubs all over the continent. Four main factors usually differentiate them:

1. **The co-working space:** Most of the hubs are structured around a space that is strategically placed in town, where young techies easily pop up to find good Internet connectivity and a nice friendly place. This is also where informal gatherings (e.g. Mobile Monday type of events⁴¹), awareness raising or capacity building events take place.

41.– <http://www.mobilemonday.net/>.

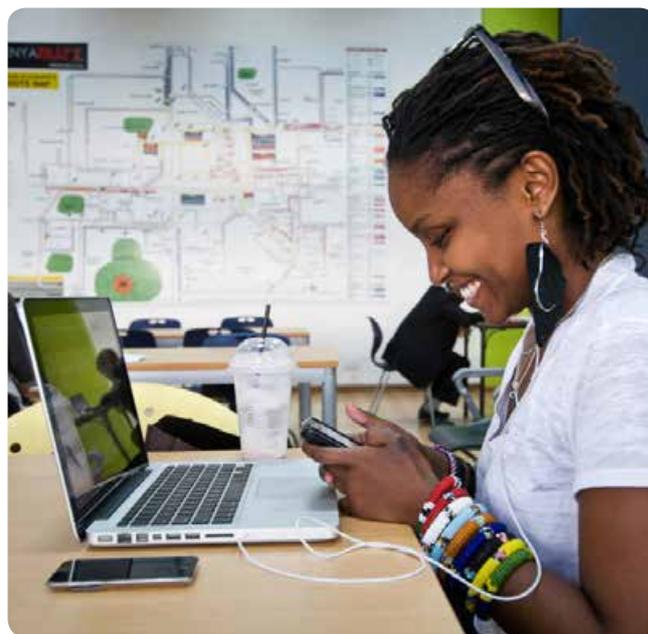


Photo: UNDP

2. **Commercial functions:** Some of the hubs have a series of services they sell. The most common one is to play a broker role: they get work and projects and then select members of the community to execute the tasks. This is the case for Jokkolabs⁴² in Senegal. This function requires resources for business development, and for coordination and project management. Other functions include organizing a training business (e.g. Mobile Web Ghana⁴³ in Ghana or dLab in Tanzania), or providing research and consulting functions as a team (not as a brokerage function; this is the case of iHub in Kenya or dLab in Tanzania⁴⁴).
3. **The focus in the innovation pipeline:** The journey from an idea to a successful start-up is long and has multiple phases. There are usually three key stages:
 - » **Seed funding stage:** In this stage, an entrepreneur or a team has an idea, but needs to transform this idea into a prototype to demonstrate the potential. Usually, a small amount of money is required (in the order of \$5,000), and it is the role of competition to provide such amounts. At this stage, entrepreneurs typically need technical support (mentor with technical skills), technical resources (a place to work and shared resources, for e.g. hosting their prototype, etc.) and contacts with partners that can help deploy the product (e.g. mobile operators). During this stage, the entrepreneur usually works part time on the project, and completion takes from 6–12 months.
 - » **Pre-incubation stage:** During this stage, the project moves from a prototype to the set-up of a company.

42.– <http://jokkolabs.net/en/>.

43.– <https://mobilewebghana.org/>.

44.– <http://www.dlab.or.tz>.

At this stage, entrepreneurs need support for developing a business model, setting up a company, and contacting and engaging with angels investors and venture capitalists. Entrepreneurs also need guidance and mentors to support them during the phase. The profile of the required mentors in this phase is more on business than on technical skills. At this stage, a few staff members are working full time on the projects to move from a prototype to a product. The amount of money required to complete this phase is usually in the order of \$25 to \$50,000, depending on the type of project and if it requires investment (e.g. IoT projects or drones, etc.).

- » **Incubation stage:** At this stage, the company is launched and starts to develop its activities. The entrepreneur usually needs a series of services, such as:
 - A dedicated office and access to facilities such as a meeting room;
 - Use of shared resources such as administration and accounting;
 - Support in business development and access to investors;
 - Mentors; specialists in the domain of the company products.

No tech hub provides services at these three levels; they usually focus on one. For example, in Kenya, iHub focuses more on the seed funding stage, while m:lab East Africa focuses on the pre-incubation phase and CTIC⁴⁵ in Dakar on the incubation phase. Some spaces do not really provide such services, but just help with the seed funding stages by organizing competitions. For example, this is the case with Jokkolabs in Senegal or Buni Hub⁴⁶ in Tanzania. In most cases, having tech hubs with a co-working space provides support at the seed funding stages. Hubs that are more at the pre-incubation or incubation stage are more business oriented and provide company hosting, but not a co-working space.

4. **Theme focus:** At the start of the tech hub movement, tech hubs were all focused on technologies (e.g. mobile and web), but were generalist in their targeted communities and their sectoral focus. Over time, more focused hubs have emerged: some are dedicated to women in ICT (e.g. Jjiguene⁴⁷ in Senegal) and some are focused on data science and open data (e.g. dLab in Tanzania or Jakarta's open data lab⁴⁸).

Based on the study findings, and given the absence of any space, the most pressing need is to structure the community. Thus, this roadmap is geared at focusing on the development of the following elements:

45.– <http://www.cticdakar.com/>.

46.– <http://buni.or.tz/>.

47.– <http://jjiguenetech.com/>.

48.– <http://labs.webfoundation.org/>.

- **A co-working space** that is strategically placed in Banjul to attract young techies in modern conditions (good Internet connectivity; nicely designed space) and is also set for hosting events. Based on the interviews, the co-working space should also offer computer access to support those who can't afford equipment. In the same way, to efficiently and effectively support the emergence of innovative value-added services in the mobile area, the space should develop relationships with mobile operators and offer technical innovation platforms (e.g. Emerginov⁴⁹) that enable innovators to design, develop and deploy their services easily in all technologies, including short message service (SMS), interactive voice response (IVR) and unstructured supplementary service data (USSD).
- **Develop an ICT Yellow Pages:** This will foster collaboration between young developers and market, joining their services.
- **A series of events to assemble the community regularly, such as hackathons (see box 5).** These events should focus on informal internal discussions, but should also include thematic ones on some specific sectors (tourism and agriculture) that are priorities for the country. The aim here would be to engage and connect young techies with organizations with specific problems or ideas from targeted sectors. IT also helps to boost innovation and showcase local coding competency.
- **An annual competition for seed funding** with potentially some specific themes following the model of PIVOT East.⁵⁰ This competition should be a starting point that engages with winners in **a 12-month mentorship programme** to enable them to make their path to success. As part of this item, the future tech hub should investigate opportunities of corporate venture capital (see the opportunity highlighted in the market research done by the company GSMA⁵¹), particularly with local mobile operators.
- **A deep training programme.** Based on the study, the following topics should be prioritized:
 - » Graphical design
 - » Multimedia production
 - » Web development
 - » Mobile technologies.

Other topics such as specific software development or IoT courses will emerge as the community develops.

Given the success of women's programmes in other countries, the tech hub should also consider running a women-specific programme to develop opportunities for girls in ICT. This programme should leverage existing initiatives,

49.– <https://emerginov.ow2.org/>

50.– <https://www.facebook.com/pivoteast/>.

51.– https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2016/10/Corporate-venture-capital_An-opportunity-for-mobile-operators-and-startups-in-emerging-markets.pdf.

particularly the Give1Project. The hub will also have to expand its visibility on the regional and international scene to benefit from potential international investments.

Finally, it is important to highlight risks to the set-up of such hubs. The main central one is related to sustainability. When it is established and visible, the hub should consider adding a commercial arm. Naturally, the training activities should generate revenue after the image and reputation of the hub is made. According to the demand and the market,

the hub should consider adding consulting and research activities.

However, based on other tech hubs' experience, the timeline to reach sustainability is relatively long (3–5 years) and a minimum funding should be available to launch the hub and support it until it reaches this sustainability. This usually corresponds with a budget of at least \$750,000 to \$1 million.

Box 5: Hackathon: coding for problem-solving

As the demand for programming skills is constantly increasing, people are finding new ways to increase their knowledge. Thanks to online interactive platforms like Codecademy and Massive Open Online Courses (MOOCs), interacting with other people interested in learning programming through meet-ups and hackathons, a plethora of options now exist for many learning styles, each with different learning and employment outcomes.

A hackathon is an event, typically lasting several days, in which a large number of people meet to engage in collaborative computer programming.* The aim of these events is to gather programmers

to code collaboratively in a short period of time. Many companies are adopting the hackathon concept to allow development teams to work on chosen projects.

The creation of a strong community and the opportunity for participants to learn from others while solving a complex problem are the main strengths of these events. Training workshops are a great parallel track for all participants, especially for newcomers.

Many successful hackathons have been organized in Africa in the last years, such as Hacks4Africa in Johannesburg, South Africa, She Code Africa in Ikeja, Nigeria and Microsoft Build for Africa in Nairobi.

* *Oxford Dictionaries* (<https://en.oxforddictionaries.com/definition/hackathon>).

STRENGTHENING SECTOR COORDINATION AND SUPPORTIVE REGULATIONS

For the sector to achieve these new opportunities, it is essential that the public and private sector engage in a more coordinated approach. For this, the roadmap is geared at developing a national ICT development plan and strengthening the sector coordination framework and institutional support with the creation of a sector core team.

Advocate for a national ICT development plan

The set-up of a tech hub is only one part of the equation to develop the innovation ecosystem in The Gambia. Without a clear investment from the government, the tech hub's chance of success is limited. The government should consider putting innovation and the development of digital society at the heart of its vision and not only ICT strategy.

The Gambia should follow the path of other successful countries with relatively small populations in Africa, such as Rwanda or the Republic of Mauritius, and develop **a strategic vision and a dedicated policy and action plan to foster the development of the innovation ecosystem**. The roadmap identifies four key areas of interventions:

1. **Promotion of ICT as a tool for social and economic development:** One of the main challenges that was highlighted in the analysis is the lack of awareness and understanding of the potential of ICT to support activities of various organizations from private sector to NGOs. In the same way, lots of young techies, specifically in rural areas, are not aware of the type of jobs and opportunities the sector can offer. One possible way to address this challenge is to engage in massive communication

campaigns that will address both targets. Such campaigns may take different forms, but at the least following points could have positive effects:

- » A clear, visible public position of the government about the role of ICT in society and the potential of innovation to support the country's development;
- » Regular fairs to highlight examples and demonstrate how, in practice, specific ICT solutions can support specific sectors (agriculture, tourism and health, etc.);
- » An annual national competition or prize for innovation – as a communication campaign, but also as an instrument to develop the innovation ecosystem, national competitions are very effective (see a report highlighting their impact⁵²).

Such campaigns will create interest and attract attention, but alone will not be a strong factor of change.

2. Innovation support: The second key element is to support the change through incentives for early movers. The incentives should focus on three targets:

- » **Organizations investing in ICT:** NGOs and private sector organizations deciding to mainstream ICT in their work should have incentives to do so;
- » **Start-ups and innovation actors:** People investing and taking a risk to work on innovative solutions should be supported;
- » **Individuals:** The development of the sector will require development of skills as well as the development of a number of professionals in the sector. Despite existing interest among youth, it is important to support them in acquiring important skills to develop the sector.

In terms of the incentives themselves, the usual elements include:

- Tax rebate for investment in ICT for organizations interested in developing ICT in their operations;
- Tax rebate for start-ups at the beginning of their life (e.g. first 3–5 years). An example of one of the other incentives for start-up launch is reduced constraints for registration. Some countries, e.g. the Republic of Tunisia,⁵³ have defined a 'start-up act' that provides a global context to nurture start-ups and give them favourable conditions. As part of this start-up act, a public development fund should also be considered to finance start-ups and demonstrate their potential for a few years, until angels investors and private venture capital come on board and invests in the sector;
- Technology park to provide a physical area where all actors can set up and get specific financial support;
- Specific incentives for international investors in ICT;
- Individual grants for ICT training.

52.– <https://www.innocentive.com/files/node/casestudy/whitepaper-challenges-prize-programs-and-opportunity-government.pdf>.

53.– <https://www.diafrinvest.com/en/project-law-tunisia>.

3. Policy intervention for affordability of ICT goods and adaptation of public procurement: As the analysis of the ICT context demonstrated, some prices, particularly mobile broadband prices, are higher than in most countries on the continent. There is no explanation for this situation, particularly as the tariff of other GSM services (voice and SMS) is on par with or lower than neighbouring countries and the average on the continent. PURA should investigate this situation and implement policy change to lower those prices that hamper the development of data usage.

Additionally, public procurement rules should be reviewed to facilitate the participation of local MSMEs in government tenders.⁵⁴ For this, new standards and procurement guidelines have to be established.

4. National open data initiative: Finally, as a longer-term plan, The Gambia should consider engaging in the open data movement. A large number of countries in the region (Côte d'Ivoire, Senegal, Sierra Leone, Ghana, Nigeria, Burkina Faso and the Islamic Republic of Mauritania, for example) and all over the continent have started to set up a national open data initiative. The potential social and economic impact of such initiatives is huge, and they serve as a catalyst for the innovation ecosystem and the development of digital society. Open data has not only the objective to develop tech innovation, but also has a major role to implement open government, transparency and accountability. The change of regime is an opportunity to implement a set of new open governance principles that include open data. Tunisia and Burkina Faso are the best examples of such a change in governance after the change of regime. Many development partners are usually interested in funding such initiatives, and the World Bank has a full process and a set of methodologies and tools in place to support countries in this journey. Such an initiative will not only serve the ICT and innovation sector, but also the country at large.

Finally, the future development of online e-government services, as announced by MOICI during the field study, will largely benefit from the sector's development and the availability of more skilled companies and individuals to support the government instead of calling for international expertise. Likewise, the development of ICT within the government will also be an opportunity for entrepreneurs and individuals in the future.

54.– UNCTAD, 2013, "Promoting local IT sector through Public Procurement" (UNCTAD, 2013).

Strengthen the sector coordination framework and institutional support

For the sector to achieve these development goals, it is essential to avoid gaps in services and overlaps between the public and private sectors. The following are recommended coordination mechanisms that can structure the sector:

- **Create an ICT board:** The aim of the ICT board will be to ensure the quality of ICT service providers. It will apply a quality assurance system based on international standards. The registration of ICT firms at the board should be voluntary, but will ensure clients' trust.
- **Once established, the ICT board should develop a sector consortium:** The consortium will allow small firms in the sector to ally in order to apply for larger orders from the public sector (procurement), but also eventually larger orders from abroad.
- **Strengthening the existing sector association, ITAG:** The sector association's aim will be to interact with the public sector and report all issues affecting businesses. It will also provide coordination and a common direction for the development of the sector, contributing to implementation of technical assistance projects and actively engaging the definition of a quality assurance framework for ICT-related courses in close collaboration with NAQAA.
- **Support the set-up of multi-service kiosks in rural areas with access to Internet:** In order to minimize the urban-rural divide, such kiosks will provide connectivity, assistance on online services, phone repairs, assistance for administrative work or bookkeeping. This will increase access to broadband Internet in rural areas.
- **Assess the feasibility to establish a tax on telecom companies to support the development of the ICT sector and**

access in remote rural areas: Developing a mechanism to collect contributions from telecom operators to subsidize the expansion of ICT in underserved communities. If well managed and transparent, this tax could be useful to increase rural Internet access. The government could consider and implement solutions to these issues, including developing strategies for effective use of funds, timely publication of monitoring and financial reports, and other information in open data formats.

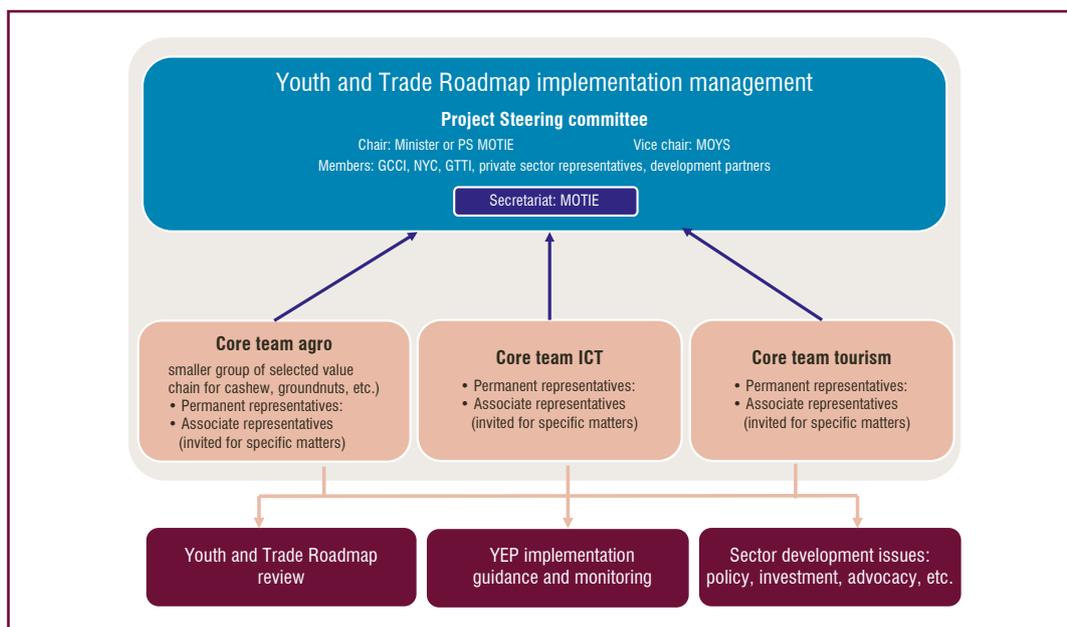
Importance of coordinated action and youth representation

The roadmap is geared towards creating conditions for the favourable expansion of youth economic opportunities in ICT. This development requires the elaboration and coordination of various activities. Success will depend on stakeholders' ability to plan and coordinate actions in a tactical manner. Activities must be harmonized across the public sector, private sector and education providers in order to create sustainable results and guarantee maximum impact.

The roadmap is not any specific institution's responsibility; rather, it is the implementation framework of The Gambia's National Development Plan and main economic policy, and strategies have a bearing on youth economic empowerment, including the National Youth Policy, Gambia National Export Strategy, the new National Entrepreneurship Policy, and the Youth and Trade Roadmap.

It is recommended that The Gambia establishes independent **sector core teams** for public-private deliberations that act in an advisory capacity to the government and the private sector regarding issues related to or affecting a specific sector and their related development plans.

Figure 21: Youth and Trade Roadmap implementation management framework



The core team' objectives are:

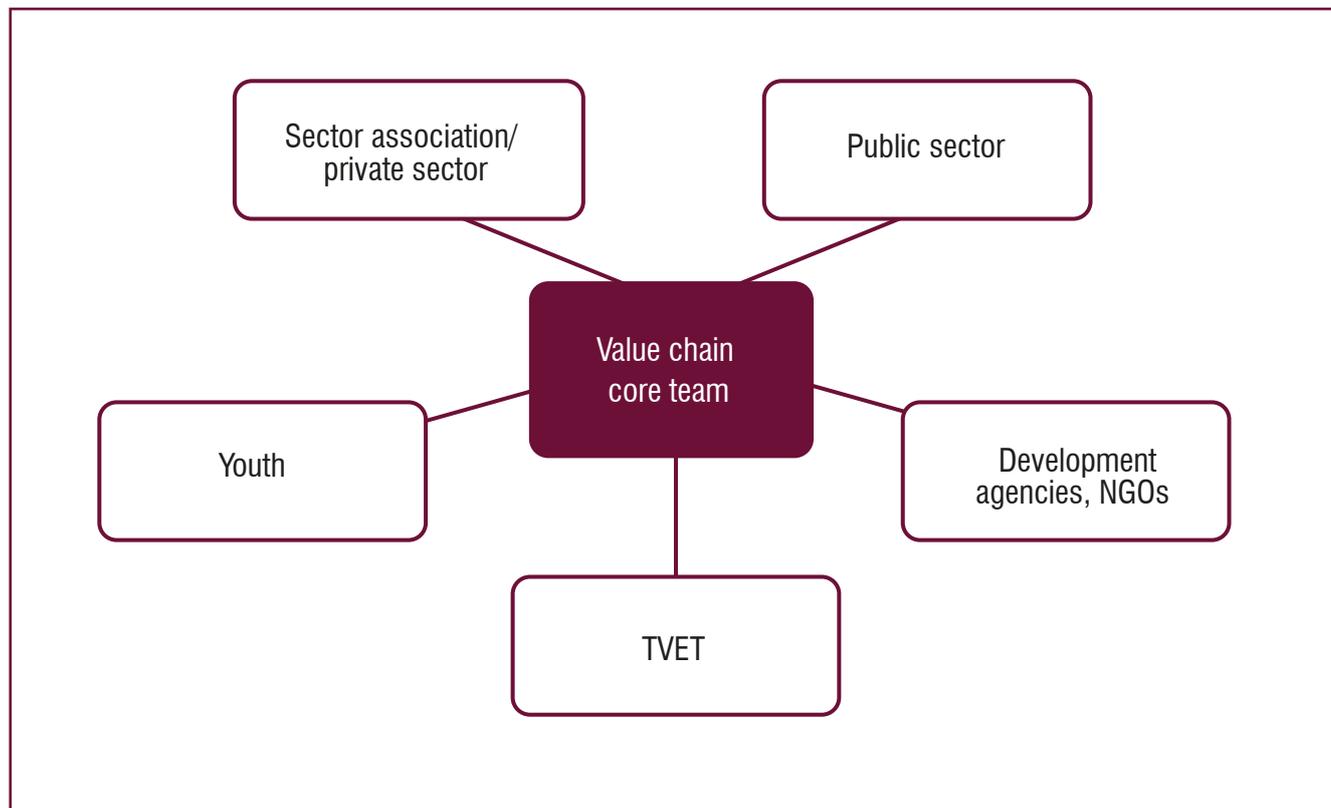
- a. To ensure that the interests of sector stakeholders are represented in the policy alignment, planning and road-map implementation;
- b. To act as a consultative and technical advisory body to the Youth and Trade Roadmap steering committee, Gambia Ministry of Trade, Industry and Employment, Ministry of Youth and Sports, Ministry of Agriculture and other national stakeholders;
- c. To convey the aspiration and ideas of the youth in the design and implementation of the sectors' development strategies, both in the public and private sectors.

The core teams are composed of representatives from the country's youth, public sector, sector associations and private sector, TVET and development agencies and civil society, and locally based NGOs, as described in figure 22.



Photo: ITC

Figure 22: Youth and Trade Roadmap sector core team



ICT YOUTH AND TRADE ROADMAP – PLAN OF ACTION

Activities	Priority*	Starting period					Beneficiaries	Leading institutions	Implementing partners
		2018	2019	2020	2021	2022			
1. Strengthen sector coordination and regulations									
Operational objective 1.1 Increase sector coordination and synergies									
1.1.1 Create an ICT sector core team to oversee roadmap design and implementation The core team plays a leading role to ensure a favourable expansion of youth economic opportunities in ICT through the monitoring of the roadmap implementation. The core team can be used as a stepping stone toward the creation of the ICT board.	ST	X	X	X		Sector stakeholders	ITAG	ITAG	YEP
1.1.2 Create an ICT board to oversee sector development, need of policy changes and investment in ICT infrastructure and to foster clustering culture Promote strategic clustering or consortium approaches in areas and situations where companies can complement (not compete against) each other in offering and providing solutions to clients, such as for public tender.	ST	X	X	X		Sector stakeholders	MOICI	MOICI	PURA
1.1.3 Strengthen the capacities of the ICT sector association <ul style="list-style-type: none"> To support the development of the sector To advocate for policy changes To actively participate in the design of curriculum in TVET To promote ICT services by developing a national portal and organizing a demo day To develop a code of conduct on quality and reliability of services. 	ST	X			ITAG	MOICI	MOICI	ITAG members	
1.1.4 Develop an official Yellow Pages for all ICT providers and reference mechanism The objective is to improve statistical data collection on ICT companies in order to develop an effective regulation, based on empirical needs. The data will also be used as a benchmark to evaluate the impact of the new regulations.	ST	X	X			Sector stakeholders	ITAG	ITAG	YEP
Operational objective 1.2 Align regulations with sector's development needs to stimulate ICT sector's growth									
1.2.1 Conduct a gap analysis of digital legislation (i.e. digital signatures, data protection and online payments, etc.), taking into account existing draft legislation to identify areas where improvements can be made.	ST	X	X	X		ICT stakeholders Consumers Bank	MOICI	MOICI	Specialized foreign agency Central Bank
1.2.2 Finalize the regulations to foster the development of mobile banking and mobile money Based on identified gaps in digital legislation: (1) elaborate specific policy recommendations, including legislative text, to align digital legislation with the ICT sector's long-term requirements (and the overall digital economy), and (2) develop related policy paper to form the basis of an advocacy and awareness-raising campaign. Establish a payment gateway, which is a crucial piece of infrastructure to enable government e-services and e-commerce applications.	ST	X	X			ICT stakeholders Consumers Bank	MOICI	MOICI	PURA
1.2.3 Strengthen the ICT consumer protection law on mobile data Develop a legal obligation for telecom companies to report accurate mobile data usage. Negotiate the reduction of mobile data price to end users.	MT		X	X		ICT stakeholders Consumers Bank	MOICI	MOICI	PURA
1.2.4 Assess the feasibility of establishing a tax on telecom companies to support the development of the ICT sector and access in remote rural areas Assess the feasibility of developing a tax and funding mechanism to collect contributions from telecom operators to subsidise the expansion of ICT in underserved communities, especially remote rural areas.	LT		X	X	X	MSMES in ICT-related services	MOICI	MOICI	PURA Telecom companies
1.2.5 Design an e-governance plan and national open data initiative With the support of the ICT board, establish a working group to design an e-governance roadmap focusing on required policy, regulations changes and national open data initiative.	LT				X	ICT stakeholders	MOICI	MOICI	PURA
Operational objective 1.3 Create an enabling environment for fostering quality compliance and IP creation									
1.3.1 Improve awareness and compliance with international quality standards through accreditation Develop and implement standardization and certification for methodologies, processes and products in order to increase the level of trust in The Gambian ICT product offering. Increase awareness of the public and private sector about ICT accreditations provided by international companies such as Microsoft, IBM, Oracle or Cisco.	ST	X	X	X		ICT stakeholders	PURA	PURA	ITAG TGSSB

Activities	Priority*	Starting period				Beneficiaries	Leading institutions	Implementing partners
		2018	2019	2020	2021			
<p>1.3.2 Assess existing intellectual property (IP) laws and agreements Review existence of prior analyses of WTO-TRIPS-aligned laws legislation on industrial property, copyright and related rights.</p> <p>1.3.3 Build awareness of ICT companies toward IP registration and protection Improve private sector awareness about intellectual property registration and provide guidance regarding IP creation, application filing and registration.</p> <p>Review and improve existing processes to develop a new fast track IP registration by national IP offices.</p>	MT		X	X	X	ICT stakeholders Creative industries	MOCI	Specialized foreign agency
<p>2. Improve the quality and relevance of ICT skills development programmes</p>						MSMES in ICT-related services	PURA NCAC for copyrights	PURA
Operational objective 2.1 Improve the coordination mechanism for the development of quality training in ICT								
<p>2.1.1 Support the development of inter-ministerial coordination arrangements for skills development in ICT Establish a working group composed of public, private and TVET through the ICT board.</p>	ST	X				Value chain stakeholders TVET	MOCI MOTIE	MoHERST MOYS NAQAA NYC GIEPA GCCl Sector associations TVET providers
<p>2.1.2 Establish an ICT education providers' working group The group will have the responsibility of promoting national development of skill standards, common curriculum, learning materials and teacher training programmes with the involvement of all TVET providers and industry.</p>	ST	X				Value chain stakeholders TVET	NAQAA	TVET providers
<p>2.1.3 Update in The Gambia Skills Qualifications Framework (GSOQ) for ICT and develop a quality insurance mechanism to certify training providers and their courses</p>	ST	X	X			TVET providers	NAQAA	TVET providers
<p>2.1.4 Integrate tracer studies mechanism in TVET management Train TVET management to carry out tracer studies for all trainees.</p>	ST	X	X			TVET providers	NAQAA	TVET providers YEP
Operational objective 2.2 Upgrade and diversify the range of ICT skills development programmes								
<p>2.2.1. Strengthen basic ICT skills training courses across education providers On the following themes:</p> <ul style="list-style-type: none"> Office suites, including word processor, spreadsheet and presentation programme, and document editing Basic Internet web search. 	ST	X	X			Public and private TVET providers Universities and colleges across all sectors	NAQAA	Sector association
<p>2.2.2 Develop short-term specialized courses for technical and vocation training programmes On the following themes:</p> <ul style="list-style-type: none"> Web content development Hardware, mobile phones repair and deep repair ICT user support. 	ST	X	X			Public and private TVET providers	NAQAA	Sector association Foreign partners YEP
<p>2.2.3 Develop and update quality technical and vocation training programmes at certificate and diploma levels on specialized topics</p> <ul style="list-style-type: none"> Software and multimedia development Applications development and testing, including new courses on voice-based services, IoT and drones Database management and data analytics. 	MT	X	X	X		Public and private TVET providers	NAQAA	Sector associations Foreign partners YEP

Activities	Priority*	Starting period					Beneficiaries	Leading institutions	Implementing partners
		2018	2019	2020	2021	2022			
<p>2.2.4 Upgrade quality of diploma delivered by the University of The Gambia (UTG) on:</p> <ul style="list-style-type: none"> General computer sciences Upgrade IT equipment. 	MT	X	X	X	X	UTG	NAQAA	Sector associations Foreign partners YEP	
Operational objective 2.3 Improve TVET capacities to deliver quality education in line with ICT sector requirements									
<p>2.3.1 Build technical teaching capacities of TVET and university staff Provide professional development activities for teachers in updated content, delivery techniques and managing on- and off-the-job training:</p> <ul style="list-style-type: none"> Incubator management, accelerator programmes, monitoring and evaluation frameworks Building public-private partnerships to develop a project IT project management. 	MT	X	X			Public and private TVET providers UTG	ICT education providers' working groups	Foreign partners	
<p>2.3.2 Establish a dedicated ICT research centre at UTG focusing on frugal innovation ('Jugaad') in ICT The main focus will be to improve the use and access to new technology in rural areas and develop new ICT-enabled services. Train staff on frugal innovation concepts and develop partnerships with other ICT TVET that are part of the 'Jugaad' Innovation.</p>	MT		X	X		UTG	ICT education providers' working group	Foreign partners	
<p>2.3.3 Support TVET in building formal linkages with private sector Organize pitching events so trainees can showcase their products and look for potential partners or employers.</p>	ST	X				Public and private TVET providers UTG	ITAG	Public and private TVET providers UTG YEP	
<p>2.3.4 Develop ICT support student placement programmes for TVET Institutions graduating ICT professionals through apprenticeship and internship need to increase graduates' prospects and the matching of industry needs with skills.</p> <ul style="list-style-type: none"> Develop student placement at UTG Formalize internship and apprenticeship positions with private companies. 	ST	X				Trainees Private companies	NAQAA	ITAG Public and private TVET providers UTG YEP	
<p>2.3.5 Create academic exchange Create programme for academic exchange with tech universities.</p>	LT				X	Teachers	NAQAA	Public and private TVET providers UTG	
3. Improve MSME productive capacities and market linkages									
Operational objective 3.1 Design and implement a digitization strategy for public agencies									
<p>3.1.1 Need assessment of ICT services and products in public services and evaluation of local ICT providers Carry out a need assessment for ICT equipment, services and training throughout the entire public sector. Identify current existing capacities among Gambian companies to carry out the public sector's digitalization plan.</p>	ST	X				Microwork initiative	Consultant	ITAG Tech hub	
<p>3.1.2 Design digitization strategy for public agencies Organize a public-private roundtable to design the strategy and plan of action.</p>	ST	X				Microwork initiative	MOICI	PURA ITAG Tech hub TGSB	
<p>3.1.3 Develop an ICT consortium to carry out the digitization plan of action and set up a microwork initiative Develop a consortium of selected companies to carry out the digitization plan and assist on the required policy review.</p>	ST		X	X	X	Microwork initiative	ITAG	Tech hub Joko Labs	
Operational objective 3.2 Foster innovation and synergies among entrepreneurs and attract investment									

Activities	Priority*	Starting period				Beneficiaries	Leading Institutions	Implementing partners
		2018	2019	2020	2021			
<p>3.2.1 Create a tech hub</p> <p>Establish a shared space for ICT start-ups to enable dialogue and exchanges among local ICT firms. The tech hub should provide basic services, including:</p> <ul style="list-style-type: none"> • Flexible leasing options that involve minimal commitment • High-speed Internet and business centre services. <p>This will foster collaboration between young developers and allow shared costs for R&D and personnel training. Potentially, micro and small companies will start collaborating to jointly market their services.</p>	ST	X	X			Young entrepreneurs in ICT	ITAG	Tech labs Give 1 Project Joko Labs ISPs GSM operators UTG MOICI YEP
<p>3.2.2 Develop a tech park</p> <p>Set up special infrastructure for FDI in ICT by creating and promoting a tech park. This will combine physical and legislative/regulatory infrastructure such as a special economic zone or export processing zone that would grant companies tax-free treatment on their imports (including hardware), exports and income, and preferential access to, and price treatment by, utilities and other services (e.g. telecoms and constant access to electricity).</p> <p>This should include a benchmarking analysis of previous attempts to create such structures in other Western African countries.</p>	LT			X	X	MSMES in ICT-related services	GIEPA	PURA ITAG MOICI UNDP Gambia Public Procurement Authority
<p>Operational objective 3.3 Facilitate cross-sector synergies developing new ICT-enabled services and products</p>								
<p>3.3.1 Organize regular hackathons to foster innovation and partnerships</p> <p>a. The hackathon should focus on particular immediate public and private sector needs to develop new products and services.</p> <p>Application development:</p> <ul style="list-style-type: none"> • Education (availability of courses and content on cloud-based platforms) • Applications development to facilitate communication and logistics in agriculture and tourism. <p>Hardware:</p> <ul style="list-style-type: none"> • Maintenance, repair and deep repair. <p>Multimedia content development for all sectors (especially tourism):</p> <ul style="list-style-type: none"> • Web marketing in tourism. <p>Database management:</p> <ul style="list-style-type: none"> • In line with digitization for public sector (monitoring, administrative processes and taxes collection, etc.) • Trade facilitation (customs procedures). <p>b. The new products and services developed would be a basis to facilitate linkages and create business partnerships between large established companies and young entrepreneurs to finance the development of ICT pilot projects.</p>	ST	X	X	X		MSMES in ICT-related services Public agencies	ITAG	Tech hub YEP
<p>3.3.2 Develop e-learning solutions for training institutions</p> <p>Develop e-learning, mobile learning or micro-learning solutions for TVET to improve access of youth in rural areas or complement existing courses.</p>	ST	X	X	X		TVEIs in other sectors	NAQAA	ITAG TVEIs Tech hub ICT companies YEP

Activities	Priority*	Starting period					Beneficiaries	Leading institutions	Implementing partners
		2018	2019	2020	2021	2022			
<p>3.3.3 Organize ICT demo days</p> <p>Develop and implement local ICT diffusion programmes targeting local market segments, to develop linkages, especially government, including local municipalities (particularly education and health) and business sectors such as financial services, tourism, accounting and auditing.</p>	MT	X	X	X	X	MSMES in ICT-related services Young entrepreneurs in ICT	ITAG	GCCI American Chamber of Commerce Youth Entrepreneurs Association	
Operational objective 3.4 Improve the quality and suitability of digital skills across sectors									
<p>3.4.1 On-the-job training programme for non-ICT technicians</p> <p>Conduct specialized on-the-job training using blended learning (e-learning courses and face-to-face training workshops at the workplace) to facilitate the digital transformation of the sectors and uptake of new technologies such as sector-specific software, especially in the following areas:</p> <ul style="list-style-type: none"> • Web and multimedia content management and publishing (in line with 2.2.2) • 3D modelling software in construction. 	ST	X	X	X	X	MSMES in ICT-related services Young entrepreneurs in ICT	NAQAA	Working group of ICT education providers	
<p>3.4.2 On-the-job training programme for ICT technicians</p> <p>Conduct specialized on-the-job training using blended learning (e-learning courses and face-to-face training workshops at the workplace) to update and upgrade qualifications and competency level of employees in order to improve the quality of products and methodologies, especially in the following areas:</p> <ul style="list-style-type: none"> • Broadcast technicians • Database specialists and systems administrators • Applications development and testing technicians. 	ST	X	X	X	X	MSMES in ICT-related services Young entrepreneurs in ICT	NAQAA	Working group of ICT education providers	
<p>3.4.3 Incentives for ICT professionals</p> <p>Provide scholarships for advanced online courses to assist ICT professionals to continue their professional self-development plans.</p>	MT		X	X	X	MSMES in ICT-related services Young entrepreneurs in ICT	ITAG	ICT education providers' working group	
Operational objective 3.5 Develop partnerships with ICT multinationals targeting West Africa									
<p>3.5.1 Partnerships with international ICT companies</p> <p>Facilitate business relationships for Gambian companies to become MNE-certified implementing partners for international ICT companies operating in Africa.</p> <p>Gambian companies would be trained and qualified to become implementing partners of renowned ICT companies in the subregion.</p>	MT	X	X	X	X	Medium-size in ICT-related services	GIEPA	MOICI ITAG	
4. Foster e-entrepreneurship and business growth in the ICT sector									
Operational objective 4.1 Foster the business growth of micro and small ICT companies									
<p>4.1.1 Build capacities of ICT incubators to foster ICT-entrepreneurship</p> <ul style="list-style-type: none"> • Build the capacity of the Startup Incubator Gambia to link with other incubators in other countries • Develop an entrepreneurship guide. 	ST	X	X	X	X	Young entrepreneurs in ICT	Startup Incubator	Tech hub YEP	
<p>4.1.2 IT start-up campaign to build linkages with the diaspora</p> <p>Organize an IT start-up in the new Gambian campaign to facilitate linkages between members of The Gambian diaspora and local IT companies:</p> <ul style="list-style-type: none"> • The campaign could facilitate school sponsoring • Investment and guidance • Equipment acquisition abroad • Outsourcing. 	ST	X	X	X	X	Young entrepreneurs in ICT	ITAG	Tech hub Start-up Incubator	

Activities	Priority*	Starting period	Beneficiaries	Leading Institutions	Implementing partners	
		2018	2019	2020	2021	2022
<p>4.1.3 Develop an ICT-specific entrepreneurship and business growth support programme The programme will focus on providing market opportunities to existing entrepreneurs, improving their business skills, participating in a pitching competition to attract investors (Youth Entrepreneurship Summit) and business coaching. The programme will be supported by an entrepreneurship e-learning portal.</p>	MT	X	X	X	X	X
<p>Operational objective 4.2 Foster the development of ICT-enabled services in rural areas</p> <p>4.2.1 Build the ICT capacities of youth centres in rural districts</p> <ul style="list-style-type: none"> • Provide internet access at cheap prices • Provide IT equipment (computers, webcams and routers, etc.) • Organize online training sessions and entrepreneurship sensitization. 	ST	X	X	X		
<p>Operational objective 4.3 Develop innovative financial products meeting market needs</p> <p>4.3.1 Financial products for ICT businesses Promote the development and availability of financial products for ICT companies, avoiding the need for collateral other than contracts.</p>	ST	X	X	X		



Republic of The Gambia

Contact information

Ministry of Trade, Industry,
Regional Integration and Employment
Independence Drive
Banjul, The Gambia
+220 422 8392
info@motie.gov.gm



International
Trade
Centre

Local office

Address:
Entrepreneurship Development
Centre, Sait Matty Road,
Bakau, The Gambia
Telephone: (+220) 4495776
E-mail: yep@intracen.org
Internet: www.yep.gm

ITC headquarters:

Postal address:
Palais des Nations
1211 Geneva 10, Switzerland
Telephone: +41-22 730 0111
E-mail: itcreg@intracen.org
Internet: www.intracen.org



This project is funded by
the European Union