

Unlocking the digital economy in Senegal

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Glossary

	<i>English</i>	<i>French</i>
3FPT	Fund for Vocational and Technical Training	Fonds de Financement de la Formation professionnelle et technique
ADEPME	Agency for the Development and Supervision of Small and Medium Enterprises	(Agence du Développement et d'Encadrement des Petites et Moyennes Entreprises)
ADIE	State Information Technology Agency	(Agence De l'Informatique de l'Etat)
AfCTFA	African Continental Free Trade Area	Zone de libre échange continentale Africaine
AFD	French Development Agency	
AGOA	African Growth and Opportunity Act	Agence Française de Développement
AI	Artificial Intelligence	Intelligence artificielle
ANPEJ	National Agency for the Promotion of Youth Employment	(Agence Nationale Pour La Promotion de L'Emploi des Jeunes)
API	Application Programming Interface	
APIX	Agency for the Promotion of Investments and Major Works	(Agence Nationale pour la Promotion des Investissements et des grands Travaux)
APTE	Youth Work-Readiness Programme Project	
ARTP	Regulatory Authority for Telecommunications and Posts	(Autorité de Régulation des Télécommunications et des Postes)
ASPT	Senegalese Tourist Promotion Agency	(Agence Sénégalaise de Promotion touristique)
B2C	Business to consumer	
BCEAO	Central Bank of West African States	(Banque Centrale des États de l'Afrique de l'Ouest)
CCV		Contoniere du Cap Vert
CFPT		Centre de Formation Professionnelle et Technique
CNIA	National Interprofessional Groundnut Council	

CNN	National Digital Council	(Conseil National du Numérique)
CV	Curriculum vitae	
DE	Digital economy	Economie numérique
DER/FJ	General Delegation for Rapid Entrepreneurship (of women and youths)	(Délégation Générale à l'Entrepreneuriat Rapide)
DFS	Digital Financial Services	Services financiers digitaux
EFT	Electronic Fund Transfer	Transfert électronique de fonds
eKYC	Electronic Know Your Customer	
ENFHT	National Hotel and Tourism School	(Ecole Nationale de Formation Hôtelière et Touristique)
ETC	European territorial cooperation	
EU	European Union	Union européenne
FGD	Focus group discussion	
FSP	Financial Services Provider	
GDP	Gross Domestic Product	
GIM-UEMOA	Interbank Electronic Banking Group of the Economic and Monetary Union of West-Africa	(Groupement Interbancaire Monétaire de l'Union Economique et Monétaire Ouest-Africaine)
GIZ	Society for International Cooperation	(Gesellschaft für Internationale Zusammenarbeit)
GPS	Global Positioning System	
ICT	Information and Communications Technology	Technologies de l'information et de la Communication (TIC)
IoT	Internet of Things	Internet des Objets
ISRA	Senegalese Institute of Agricultural Research	(Institut Sénégalais de Recherches Agricoles)
IT	Information Technology	Technologies de l'Information
ITC	International Trade Centre	Centre du Commerce International
ITU	International Telecommunications Union	Union internationale des Télécommunications
KYC	Know Your Customer	

MAER	Ministry of Agriculture and Rural Equipment	(Ministère de l'agriculture et de l'équipement rural)
MCF	Mastercard Foundation	
MCTPEN	Ministry of Digital Economy and Telecommunications	(Ministère de l'Economie Numérique et des Telecoms)
MEN	Ministry of National Education	(Ministère de l'éducation nationale)
MESRI	Ministry of Higher Education, Research and Innovation	(Ministère de l'enseignement supérieur, de la recherche et de l'innovation)
MFCAA	Ministry of Vocational Training, Learning and Handicrafts	(Ministère de la formation professionnelle, de l'apprentissage et de l'artisanat)
MMO	Mobile Money Operator	
MNO	Mobile Network Operator	
MSME	Micro, small and medium-sized enterprises	
MTTA	Ministry of Tourism and Air Transport	(Ministère du Tourisme et des Transports Aériens)
NSTS	New Senegalese Textile Society	(Nouvelle Société Textile Sénégalaise)
OAPI	African Intellectual Property Organization	(Organisation africaine de la propriété intellectuelle)
OECD	Organisation for Economic Co-operation and Development	
PA	Precision Agriculture	Agriculture de precision
PAQUET	Programme for the Improvement of Quality, Equity and Transparency in Education and Training	
POS	Point of sale	Point de Vente
PSE	Emerging Senegal Plan	(Plan Senegal Emergent)
QR	Quick response	
RNSE	National Educational Sector Report	
RTGS	Real-time gross settlement	
SEZ	Special Economic Zones	Zone Economique Spéciale
SME	Small and medium-sized enterprise	PME (Petite et Moyenne Entreprise)
SONACOS	Senegal National Oilseed Marketing Company	(Société nationale de commercialisation des oléagineux du Sénégal)

SSA	Sub-Saharan Africa	
STEM	Science, technology, engineering and mathematics	
TVET	Technical and Vocational Education and Training	
UN	United Nations	Nations Unies
UNCDF	United Nations Capital Development Fund	
UNCTAD	United Nations Conference on Trade and Development	
UNESCO	United Nations Educational, Scientific and Cultural Organization	
UNICEF	United Nations Children’s Fund	
USAID	United States Agency for International Development	
USSD	Unstructured supplementary service data	
UVS	Virtual University of Senegal	(Université Virtuelle du Sénégal)
UX	User experience	
WAEMU	West African Economic and Monetary Union	l'Union Economique et Monetaire Ouest-Africaine (UEMOA)

Executive summary

The Mastercard Foundation (MCF) has set an objective to enable 30 million young Africans, especially women, to secure employment that they see as dignified and fulfilling by 2030. In Senegal, MCF aims to create dignified and fulfilling work for 3 million young people over the coming decade.

This study aims to understand the role that digitalisation can play in supporting this objective and to identify specific opportunities that MCF can support towards the creation of dignified and fulfilling work for young Senegalese women and men.

Broad view of digitalised economy. To fully understand the employment dynamics associated with the digital economy, this study takes a broad view of the digitalised economy as defined by Bukht and Heeks (2017). According to this definition, the **digitalised economy** refers to the application of digitalised activity and technology to economic activity and not only to purely digital products and services.¹ The definition includes a consideration of the ways in which digital technology can enhance the efficiency and productivity of traditional economic activities. Examples are the use of digital technology to enhance agricultural productivity through Precision Agriculture (PA) or the efficiency and reliability of logistics.

Sectoral transmission mechanisms. A key implication of this understanding of the digitalised economy is that the adoption of digital innovation by operators in specific economic sectors – such as agriculture, manufacturing or various service industries – enhances the efficiency and therefore the productivity of the enterprises that operate in those sectors. This leads to enhanced competitiveness and productivity, and therefore growth in each sector. Sectors that grow ultimately create more jobs – both by generating employment at existing enterprises and by creating opportunities for new entrants. This linkage chain from digital innovation to employment constitutes the theory of change that underpins this study.

Deep-dive sector focus to identify the key, specific opportunities (and risks) arising from digital innovation. To understand how digital innovation manifests and the opportunities that it creates in Senegal, this study focuses on four key sectors. The deep-dive sector focus aims to unpack the specific opportunities that are created by digital innovation in sectors that are key contributors to growth, employment and policy objectives. However, the deep dives also serve as case studies to enable the trends, opportunities and risks that apply across the economy more broadly to be identified.

1 Products and services that are purely digital essentially eliminate time and space, which means that providers of digital products are competing in a highly competitive, truly global market. Realistically, few Senegalese firms are equipped (and indeed neither are many African firms) to compete effectively in this market in the medium term. Therefore, the focus of this study is to consider where digital innovation can enhance the productivity and value of Senegal's existing immovable assets, as this is where the greatest opportunity lies for Senegal's economy and society to benefit from digital technology.

Broad impact, but targeted interventions required. While digitalisation of the economy is broad and has widespread impact and implications for individuals and enterprises, this study finds that a small number of targeted, well-selected interventions with specific objectives are likely to generate the greatest part of the potential positive impact. Such specific interventions can, firstly, unlock substantial productivity gains in targeted sectors and, secondly, can create positive network effects encouraging the further development and productive adoption and application of digital technologies to address challenges, improve resilience and enhance productivity in areas of the economy and population not directly reached through targeted interventions. The deep dives into the four focus sectors aim to provide this focus by identifying the specific interventions likely to yield the greatest impact in the target sectors, but also for broader application.

The four deep-dive sectors selected for this study are: education, tourism, groundnuts and textiles. Apart from being strategically and economically important sectors, the latter three also provide insight into the three broad economic sectors: services, agriculture and manufacturing. For its part, education is a critical enabling function in developing the requisite skills for the rest of the economy. For each of the sectors, the key opportunities derived from digitalisation include:

Education

Education sector not currently supplying the skills needed to develop the economy. High pupil–teacher ratios, poor teacher qualifications, a lack of access to content and gender disparities are all major challenges in Senegal that are leading to poor educational outcomes. For instance, only 29% and 35% of children and young people respectively are achieving a minimum proficiency level in reading and mathematics. Furthermore, of the small portion of Senegalese youths that do graduate from tertiary institutions, few have the skills most in demand in the economy. And even among those studying in-demand skills such as STEM (science, technology, engineering, mathematics) schooling remains very theoretical in nature. The result is a *mismatch between the profile of the youth labour force and the needs of the job market*. The primary opportunity therefore lies in deliberately identifying the key growth sectors and the likely skills required to further grow those sectors over the next 5-10 years and implementing targeted vocational training initiatives that develop the necessary skills required by industry. Digital innovation offers two key opportunities or imperatives to do so:

- ***Using digital technologies in a blended learning environment to reach marginalised groups and to access necessary content.*** A successful online learning model is often accompanied by in-person teaching for practical learning. Adopting digital technologies in a blended learning environment enables learners to access the best educational content available globally whilst still benefitting from in-person support and interaction. It also presents opportunities to remove the gender barrier for women who have family responsibilities that limit their mobility to physical education institutions and to increase rural participation through removing the geographical barrier for rural students. There is, however, a need to follow the Virtual University of Senegal (UVS) model to ensure that poorer students also have access to the devices and connectivity needed to engage actively in blended learning. More specifically, there is a clear opportunity to

replicate the open digital spaces provided by the UVS in a way that is agnostic to educational institute.

- ***Dealing with educators' limited proficiency and understanding of digital skills.*** Policymakers have begun prioritising capacity-building for teachers. Existing initiatives include the work done by UNESCO and the World Bank in training teachers and also the work done by the Mastercard Foundation in the APTE programme with lower secondary school teachers. Many of these initiatives, however, do not focus on digital skills training as their core value addition. There is therefore a need to coordinate with existing initiatives to incorporate digital skills into the educator training packages.

Looking beyond just digitalisation. One of the key pitfalls of relying too heavily on digital transformation to solve long-standing challenges is that it diverts attention from challenges that do not require digital interventions. For instance, the soft skills related to creating CVs and business plans play a significant role in ensuring that youths can access income-generating opportunities. Without also focusing on soft skills, Senegalese youths will lack the professionalism required to be high-quality recruits or business-savvy entrepreneurs. Furthermore, the digitalisation of education can increase the digital divide if it is not implemented in a coordinated manner.

Agriculture: Groundnuts

Digitalisation offers the agriculture sector a range of compelling opportunities for productivity and employment gains. The peanut or groundnut value chain in Senegal is identified as a particular area where digitalisation can enhance efficiency and generate youth employment. Groundnut production is one of the leading employers and producers in the agriculture sector; here, gains in the peanut value chain can have a far-reaching impact on livelihoods and the economy more broadly. Key challenges in the value chain include bottlenecks, poor logistics and coordination, asymmetric information flows and limited access to inputs. The greatest opportunities to arise from digital innovation lie in two key areas:

- ***Enhancing the productivity of farming practices.*** PA is the adoption of data and advanced technology to optimise farming processes. Advanced sensors and equipment can enable farmers to monitor crops precisely, reducing misapplication of inputs and increasing crop efficiency through increased yields with less wastage. Furthermore, PA can increase the economic and practical viability of farming on smaller plots of land. In Senegal, access to large tracts of farmland is constrained for youths. Making smaller plots viable to farm through precision techniques may therefore increase youth employment. Beyond improving agricultural productivity, agtech innovation also has the potential to attract a younger generation to the industry, from new farmers to computer scientists, software developers, AI engineers and other experts.
- ***Improving the efficiency with which produce reaches buyers.*** Some of the greatest challenges in the peanut value chain include coordination and logistics. Enhancing the speed and reliability of logistics can reduce the need for storage and can substantially reduce spoilage. Digital innovation may offer a solution. A digital platform that connects farmers and input producers to logistics providers enhances coordination and reduces bottlenecks in the value chain. It can aggregate both formal and informal transport companies to meet the needs of

value chain participants and facilitate access to specialist transport infrastructure such as cold chains. Therefore, a platform of this nature can be used to efficiently coordinate the movement of agricultural goods between parts of the value chain. While an example of such a solution is already present in Senegal, the further scaling of these solutions will require the transport providers to have greater access to capital and risk management solutions.

Textiles

A tale of two sub-sectors: Textile manufacturing remains on the decline, while designer apparel shows promise. Despite producing cotton and benefitting from multiple beneficial trade agreements, Senegal's textile industry remains globally uncompetitive: exports have steadily declined over the past decade, while the importation of fabric has increased. Digitalisation and automation could possibly improve the efficiency of the industry, but this would probably be accompanied by the loss of jobs – often of low-skilled, vulnerable workers – owing to automation.

On the other hand, the country has a rich tradition of design and embroidery and high-end apparel designs, using traditional techniques and styles. Traditional Senegalese-styled clothing has a strong market locally and digital tools could also help designers to take advantage of international opportunities. Two specific opportunities arise:

- *Digital tools can benefit designers.* Digital design tools are popular internationally and can contribute to the efficiency and competitiveness of the Senegalese apparel sector. Internationally, most designers use clothing design software or graphic design software to create their fashion sketches and manufacturers prefer (and often require) the use of such digital tools. This technology can create a number of efficiencies: for example, by facilitating custom measurements and minimising fabric waste. Furthermore, digital sketches allow manufacturers to re-create designs better, which ensures better quality and creates opportunities to pitch designs to global buyers.
- *Digital platforms offer a significant opportunity for designers to reach new and larger consumer groups.* Senegalese designers already use digital channels for marketing, sales and communication with customers, but their use and understanding of digital tools remain narrow and limited primarily to social media. Using social media to conduct business does provide designers with an opportunity to showcase their designs to an online audience, such as through Instagram or Facebook. It also enables digital communication with customers through WhatsApp. However, social media platforms generally cannot facilitate logistics or aggregate payments. In addition, whereas designers can reach large markets with platforms such as Instagram, advertising on platforms can be expensive. But platform participation does allow businesses to expand and manage a higher frequency of orders and a larger clientele; it also signals that an enterprise is “official”, in this way building trust. Moreover, allowing consumers to buy online increases local and international markets as sales are no longer limited by location.

Tourism

A promising but vulnerable sector. The tourism and hospitality industry is a significant generator of employment in Senegal. It is an industry with much potential for increasing market access and efficiencies through digitalisation. However, the sector is also vulnerable to shocks – as the COVID pandemic has shown – and it has struggled to break into the international market at scale. The sector largely fails to reach or cater for global tourists, apart from the French, owing to both language barriers and challenges in creating and managing an effective online presence and facilitating affordable cross-border payments. Furthermore, poor customer service skills are a major challenge in the industry.

Expanding the user-friendly online presence of tourist offerings an important first step for growth. Globally, a social media and an online presence are increasingly central to any leisure and business tourism offering. To highlight Senegal's unique nature and culture and set itself apart from competitors, its online and social media visibility needs to be expanded. Therefore, there is a big opportunity for social media marketing and for increasing the use of websites for all types of tourism. Moreover, by offering tourist information in languages other than French, Senegalese tourist offerings will appeal to a broader range of tourists. This opportunity entails not only translating existing information into multiple languages, but also developing the language skills of tourism graduates so that they can interact and communicate with tourists in their native languages.

Expanding the market through digital platforms. There is an opportunity to increase the number of visitors to Senegal by improving the linkages of Senegalese tourism market players to international booking platforms such as Airbnb and Booking.com, whose presence in Senegal is still nascent. This would increase the online findability of Senegalese offerings.

Improving customer service to match international standards. An opportunity also exists to increase Senegal's attractiveness through improving customer service. Improving language skills, but especially training in internationally accredited hospitality, is most essential. Such training can be done locally if added to the curricula for tourism studies but also through online courses together with mentorships to assess students' abilities and their progress.

Resolving digital payment challenges. A substantial opportunity exists to reduce the barriers to accepting and making digital payments, particularly international payments. Travelling with cash is unsafe, and the ability to book and pay for trips securely in advance is an advantage. Local digital wallets are not accessible to international visitors, and therefore an opportunity presents itself to expand solutions for both online and in-person digital payments.

Youth Insights

Youth perceptions and experiences also critical to informing an understanding of the impact of digitalisation. Given the ultimate objective to grow dignified and fulfilling work for young women and men, it is crucial not only to understand market

trends and opportunities for digitalisation as outlined above, but also to consider how individuals can be equipped to engage with digital tools and innovation. Accordingly, through a combination of quantitative and qualitative research with Senegalese youths, this study explored how these youths currently understand and perceive the digitalised economy, the extent to which they feel they are digitally enabled and the risks that they face. The major findings from the Youth Insights research include:

- ***Entrepreneurship now has higher appeal than employment.*** Fulfilling work for youths hinges on their ability to earn an income and support their families. Consequently, and largely out of necessity, entrepreneurship now has a higher appeal than employment. Overall, 88% of the youths surveyed reported that entrepreneurship appeals to them, while only 58% of the group said the same for employment.
- ***Youths have a growing appetite for work in the digital economy.*** Given the pervasive appeal of entrepreneurship, youths are increasingly looking for business opportunities in the digital economy. These opportunities are perceived as effective and fast ways to earn an income – especially in online retail and last-mile delivery.
- ***The digital economy is broadly available to young Senegalese men and women, but challenges are experienced in the cost and quality of connectivity, particularly in rural areas.*** No fewer than 95% of the youths surveyed reported having access to electricity and a mobile phone, whereas 39% of the respondents reported having access to a laptop or a personal computer. However, 74% of them reported that slow connectivity to desired websites was a challenge, while having insufficient data bundles was the second most prevalent challenge. Only 26% of the respondents reported having internet access at home, where connectivity is mostly attained through purchased mobile data.
- ***A narrow understanding of the digital economy limits usage.*** Young Senegalese men and women view the digital economy primarily as the online channels through which they can make money, particularly via social media. *“It is the money you earn through social networks.”* Social media, followed by e-commerce platforms, are the primary facilitators of youth engagement with the digital economy. Specifically, the youths are using social media to network and share job opportunities, buy and sell goods, and engage in influencer marketing. However, awareness of the broader digital tools to enhance productivity and creativity is limited. A small constituent reported that they use the internet to gain knowledge or skills, while digital work tools are used less, and custom developer solutions are used by only a handful of the respondents.
- ***Digitalisation has imposed certain perceived and real security risks.*** The respondents identified a number of disadvantages arising from the increase in digitalisation, such as the risk of false information and advertising on social platforms. A fear of encountering fake jobs, investments or pyramid schemes has caused some youths to become less trusting of digital services.
- ***A feeling of disenfranchisement.*** The Youth Insights research suggests that the youths in Senegal do not feel that their voices are being heard in discussions and plans for the digital economy: *“The problem here is that we don’t integrate young people, we use them. Adults have to make room for young people to develop.”*

Cross-cutting opportunities

Across the sector deep dives and the Youth Insights research, four key cross-cutting opportunities arising from digitalisation emerge:

- 1. *Adaptation of local business practices.*** The global trend towards digitalisation is an undeniable reality. This trend is also present in Senegal, even if relatively nascent compared to many other countries. Senegalese youths tend to equate digitalisation with social media, both as a channel for societal engagement and to market and sell products. To a lesser extent, they also engage with the emerging e-commerce platforms. The same holds true for entrepreneurs across the focus sectors. This view misses the bulk of opportunities that can be derived from digital innovation. Improved understanding of the breadth of applicable digital innovation for individual businesses and the adoption of appropriate digital tools in different value chains therefore constitutes a major opportunity to improve efficiency and productivity across sectors. Those Senegal businesses engaging with global customers – such as in the tourism sector – have the most urgent need to adapt their operations and ensure that they are able to entice, engage and sell effectively to global consumers through online channels and platforms. This is not only an opportunity to reach new customer markets; it is also an imperative to stay in business. Regardless of whether Senegalese businesses do effectively adapt, the trend towards consumers' engaging with enterprises online will continue, meaning that a failure to adapt will result in an inability to compete for customers globally, leaving businesses behind.
- 2. *Efficient logistics and coordination to support digitalised value chains.*** Digital innovation means that products can be marketed, sold and paid for remotely. However, physical products cannot be transmitted. Providers of physical goods still require an effective solution to get the goods into the hands of customers. Transport and logistics have always been key to the functioning of all goods value chains; the digitalisation of commerce only makes this more important. The ability to coordinate, communicate and track goods and vehicles in real time means that digital innovation is creating major opportunities for enhanced efficiencies in the logistics sector. For agriculture sectors, improved logistics not only means that produce can reach the end buyers more quickly and efficiently; it also reduces the need for costly and scarce storage and minimises spoilage. The implication is that improved efficiency, reliability and speed in the logistics sector resulting from digitally enabled coordination have the ability to reduce loss substantially and therefore to enhance productivity across a vast number of economic sectors. Improved tracking and monitoring throughout the value chain can also play a major role in improving the transparency of individual value chains, an increasingly important requirement for trade.
- 3. *Application of digital technology to improve production practices.*** Digital technologies can enhance the yield of agricultural products and the efficiency in manufacturing goods. PA can enable farmers to monitor crops precisely, reducing the misapplication of inputs and increasing crop efficiency through increased yields with less wastage. Similarly, in the manufacture of apparel, digital design tools, for example, help apparel designers to create a number of efficiencies such as minimising fabric waste and more easily and consistently re-creating designs.

4. **Carefully targeted education and skills training to build those skills most needed to support the digitalisation of priority sectors.** Senegal currently faces a significant skills mismatch. While there is a high level of graduate unemployment and underemployment, key growth sectors struggle to find candidates who have the skills that they require. There is therefore a significant opportunity to build on existing programmes to develop the key skills required in priority sectors through targeted training courses aimed at young Senegalese men and women. Digital skills would be an important skill to incorporate in these training courses to equip youth job-seekers with the requisite skills to help local businesses and sectors adapt to the digitalised economy. But they should not be the only skills targeted: STEM skills and soft skills such as customer service skills and language skills are equally important. The greater adoption of digital learning tools through blended online/offline learning programmes offers significant opportunities for local learners to access global content and teachers while still benefiting from offline engagements through mentoring and tutoring relationships.

Imperatives for action

For these opportunities to materialise, interventions are required to (a) further develop an enabling regulatory and policy framework that takes account of trends and risks in the digitalised economy and which balances regional processes with national policies to ensure that there are no gaps and (b) directly support private sector players to develop, adapt their practices and processes, and adopt digital innovation. The Digital Senegal 2025 strategy already provides important building blocks in this regard. This study identifies six key priorities for further focus:

Convene key stakeholders towards an industry-led, regulator approved framework for data governance. The governance of data collection, storage and use will fundamentally shape the extent to which the development and adoption of innovative digital technologies will manifest in Senegal. The creation of a governance framework that is led by industry rather than regulators is more likely to be adopted and the spirit complied with, than a top-down regulator-led framework. The pervasive nature of data and the challenges in effectively enforcing the strict regulation, mean that industry players need to see the benefits and incentive to comply, beyond just formal regulation. Examples from the UK with their open banking guidelines and from South Africa's Financial Sector Charter, provide illustrations of how an industry led approach can be successful in other fields.

Targeted support for MSMEs in the tourism sector² to reach global consumers. Increasingly, global tourists rely on aggregating platforms to find tourism providers. Platforms like Booking.com and Airbnb aggregate the market for travellers seeking guesthouses or short-term rentals. To tap into this global network of travellers, Senegalese providers would need to ensure they are visible and attractive to platform users. This requires the ability to manage online bookings, process cross border payments, communicate in the language of the platform, as well as ensure that their value offering stands out to potential travellers. These platforms also typically rely on

2 This study identifies the tourism sector as a cross-border services sector with substantial opportunity for growth and youth employment creation, however, similar support would likely be applicable to other MSMEs engaged in cross-border trade.

consumers' ratings of providers, hence consistent customer service and effective communication is critical to building and maintaining providers' reputations. Targeted support to support to MSMEs in the tourism to build greater understanding of the requirements to operate and compete in these global markets and the development of skills to be able to do so is therefore a major opportunity to grow the local tourism sector.

Support the local digital economy to develop context specific solutions.

The development of digital solutions is an obvious prerequisite to the digitalisation of individual sectors and the economy more broadly. Therefore, whilst the growth of the local ICT/ start-up sector will not be a major direct contributor to employment, it is nevertheless a critical sector to support. The digital solutions and innovation developed within this sector will be a major engine for productivity gains, growth and ultimately employment generation across all other sectors. The unique regulatory, infrastructural and cultural context of Senegal (as with any country or society) means that context-specific solutions, or at least unique adaptations to existing solutions, will be required. Supporting local digital innovators relies heavily on creating a supporting enabling environment both in terms of enabling regulation but also proactive engagement, support and clear communication from supervisors and policymakers. Beyond creating a strong public enabling environment, innovators also need access to key prerequisites to be successful: the development of an ecosystem favourable to start-ups is critical and requires working with incubators, tech hubs and accelerators to support early-stage innovators to access capital, provide them with training and mentoring, and provide legal counselling and support to aid in navigating regulatory requirements.

Direct support to logistics ecosystem to encourage the scaling of improved, technology-driven solutions. This study identifies logistics as a sector critical to the growth of the majority of sectors in the economy. The increasing digitalisation of the economy has only increased the critical importance of an efficient and reliable logistics sector globally. In many agricultural value chains, improved logistics can also substantially reduce losses from spoilage. Emerging logistics platforms in Senegal offer real opportunities to improve the efficiency and reliability of domestic logistics and are able to effectively aggregate and coordinate existing formal and informal transport networks. However, further growth of these platforms and the scaling of the logistics networks requires greater access to large sums of capital, enabling entrepreneurs to purchase new, efficient and specialised transportation vehicles. However, the provision of this capital will remain highly limited as long as the industry continues to be perceived as risky. Integrating aggregating platforms, capital and insurance providers together with providers of technologically enabled risk management solutions may therefore be key to the further scaling and improved reliability of the logistics sector.

Encouraging global players to enhance the productivity of local priority sectors through digital innovation not available in Senegal. Not all, or even most, digital innovation needs to be developed locally. Digital solutions to many of the challenges facing enterprises operating across Senegal's productive sectors already exist elsewhere in the world. Some of these may need to be contextualised to fit the Senegal

environment, but the core digital technology and innovation can be directly imported³. 'Importing' digital innovation can be approached in two, complementary ways:

- ***By incentivising global innovators to establish operations or distribute their innovation in Senegal***, for example by addressing well-established costs and risks for enterprises to enter⁴, or through direct financial incentives to shift the risk-reward equation for potential entrants. Non-financial support such as regulatory guidance, consumer research or similar can also de-risk an investment by a potential innovator.
- ***By supporting Senegalese youth to learn from global innovation***, such as through scholarships and financial support to study at global learning institutions, or by supporting internships at global digital technology players.

Supporting targeted vocational training initiatives that develop the necessary skills for local value chain players to effectively adopt digital innovation to enhance their productivity. The need to develop and access key skills is widespread and well-established in the Senegalese economy. There are undoubtedly many fundamental improvements to be made to the efficacy and quality of basic education, but as these require long-term, structural change, more immediate opportunities are to be had from targeted vocational training initiatives to generate the practical skills required by Senegalese enterprises. The TVET system has already begun trialling these kinds of solutions, and this can be further built on by identifying key growth sectors to focus on and specific skills required, and then to develop a blended learning approach to inculcate those skills, combining online learning in an optimal way with in-person tutoring. It would be important to develop certification for the training developed in this way, to add to the credibility and desirability of the training.

Estimated impact

If these opportunities and imperatives are realised, the upside potential for Senegal is substantial.

Market-oriented interventions can generate short-term gains. In the short term, the major impact would be primarily derived from the support provided to new innovation that supports the digitalisation and productivity of key established economic sectors. Interventions applied to identify and improve the training of key skills also begin to have a substantial impact on the supply of workers with good vocational skills and productive digital skills. This could boost the productivity gains from digitalisation within two to three years.

The public and private sectors must come together to entrench and expand impact. As digital solutions become increasingly embedded in many sectors, the network effects that naturally arise due to the ability to collect, use and exploit data manifest themselves. This is where the enabling environment imperatives are critical to

3 For example, the use of digital technologies to facilitate precision agriculture to benefit local farmers already exists in many parts of the world. This innovation does not need to be developed locally. The potential employment creation from developing these technologies locally is minuscule in comparison to the benefits in terms of both productivity and employment from importing the innovation.

4 including navigating and complying with local regulation, set-up and marketing costs, tailoring of services to the local context etc.

supporting sustained digital innovation in Senegal. If industry can work with the government over the short term to improve the enabling environment collaboratively and redesign the governance of data and innovation, the result would be a boost to digital innovation in the medium term, as the new rules will help to create a competitive market with a stronger enabling environment. The combination of direct innovation support, a growing local digital ecosystem and a supportive enabling environment would act collaboratively, improving the attractiveness of the country to new innovators who see both a flourishing innovative market and an enabling public sector.

Potential to create more than a million youth jobs by 2030. The potential impact of this scenario playing out is substantial growth in the productivity, growth and exports of key sectors, particularly agriculture and tourism, which already have key local endowments (arable land and unique tourist attractions) that are enhanced by the adoption of digital technologies. This growth will translate into the creation of new jobs among existing market players and opportunities for new market entrants. Across the agriculture, textiles and tourism sectors, our scenario modelling exercise estimates that approximately 1.6 million jobs could be created from the effective adoption of digital technologies. The bulk of these would be among youths, who are also better equipped to adapt to market changes with the benefit of targeted skills training. It is forecast that over a million youth jobs would be created across these three sectors, assuming that the key imperatives are realised.

1. Introduction

Problem statement and study objective

Senegal development status bound by contextual constraints. Over the past five years, Senegal has achieved significant economic gains. In 2019, the Senegalese GDP amounted to USD25 billion⁵ and reflected growth rates ranking second and third highest in West Africa and Africa respectively (Newell, 2019). Yet while the economy has performed well, the extent to which this development has been inclusive has been limited by a number of economic and socio-economic factors. These factors include high business informality, growing inequality, low aggregate employment, and a labour force participation rate far below the regional average (World Bank (2019a); Lambert (2016); Sarr (2019)). COVID-19 has further exacerbated these factors, with the livelihoods of thousands jeopardised and opportunities for employment having been rendered increasingly scarce.

Youths and women risk being excluded. While unemployment rates have grown overall in Senegal, the ability of youths and women to find gainful employment is most at risk. Youths comprise more than 60% of the total population. Youth unemployment represents around 8% of total unemployment, with young men more likely to be employed than young women (Meribole, 2020). Although this rate is relatively low compared to other parts of Africa, it does suggest a growing inability of the local labour market to harness the full economic potential of thousands of educated Senegalese youths as the country's most abundant productive resource. In the absence of formal employment opportunities, the youths are instead increasingly being forced to forge their own pathway, which can often result in informal work characterised by low income, job insecurity and a sense of dissatisfaction as skilled graduates (Meribole, 2020). This feeling of disgruntlement came to a head in March 2021, when hundreds young Senegalese violently protested against growing inequality and called for state action to deal with their critical lack of opportunities to gain meaningful employment and support higher standards of living (Johnson-Sambou, 2021). With the future of Senegal closely linked to the future of its youths, this call marks the need for a revitalised economy that leverages its resources for inclusive growth and aims to place young men and women as active participants in it.

Role of digitalisation to unlock growth and employment opportunities. The digitalised (or digital) economy refers to the application of digitalised activity and technology to economic activity. In Senegal, the digital economy represents a significant opportunity to catalyse gains in productivity and level the playing field in terms of access to opportunities. Following COVID-19, these gains have become particularly salient: marketplaces have digitalised to support small business operations; key employers have continued to do business despite lockdown restrictions; educational teaching moved online to support distance learning for digitally enabled youths; and greater access to platforms was triggered for enhanced connectivity and the dissemination of relevant information to empower individuals to find employment or create a living. As illustrated by these

5 <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD?locations=SN>

examples, the power of digital tools or the digital economy does not exist in isolation, but rather depends on how effectively the digital economy is enabled, actively engaged with, and leveraged to overcome existing constraints to unlock growth and/or employment opportunities.

Study objective. The Mastercard Foundation (MCF) has set an objective to enable 30 million young Africans and 3 million young Senegalese, especially women, to secure employment that they see as dignified and fulfilling by 2030 under the MCF Young Africa Works Programme. Given the potential of the digital economy to help achieve this goal, MCF Senegal, in collaboration with Cenfri, has commissioned this study to explore ways in which the Foundation can unlock pathways for digital transformation in Senegal so that dignified and gainful job opportunities are created or stimulated for sufficiently capable and digitally skilled youths in an increasingly digitalising market.

Approach and methodology

A diagnostic approach. This study applies a market-system diagnostic approach that places the voice of the youths at its centre alongside an analysis of how private-sector (supply-side) forces and policy and regulatory frameworks interact and influence youth employment outcomes in the context of a digital economy. This approach spans four components:

1. **A national context and regulatory analysis.** This incorporates, first, an evaluation of the current digital readiness of the Senegalese economy in terms of infrastructural prerequisites and socio-economic constraints. Second, it includes an overview of the enabling digital policy and regulatory landscape within the West African Economic and Monetary Union (WEAMU).
2. **An in-depth analysis of Senegalese youths' realities and expectations.** This involved in-country qualitative and quantitative research to understand youths' perspectives on the digital economy; identifying employment expectations, needs and gaps; and testing the current appetite for digitally enabled job creation and employment. This research was conducted via 14 focus-group discussions (FGDs), 30 in-depth interviews and a survey of 380 respondents, all of which targeted young Senegalese youths aged between 16 and 35 years of age.⁶
3. **Sectoral mapping and value chain analysis.** This focused on unpacking the way digital innovation, and its associated employment opportunities, can manifest in four key sectors that currently contribute to the growth, employment, and policy objectives of Senegal: the groundnut (peanut) value chain, the tourism sector, the textile and apparel value chain and the education sector. The first three sectors were selected for their broad representativeness of the agriculture, manufacturing and service sector in Senegal, and therefore they offer recommendations that also have economy-wide applicability. The education sector plays a cross-cutting role in generating the skills needed for engagement in the digital economy. For each value chain/sector, the role and transmission mechanism of the digital economy is evaluated in terms of how it enhances the efficiency and productivity of value-chain or sector-specific enterprises so that growth and knock-on employment/job creation opportunities are catalysed. This analysis incorporates three research elements:

6 See Annexure 2 for more detail on the methodology applied to the qualitative and quantitative Youth Insight research in Senegal.

- **Desktop research** using an array of national statistical data from national government sources and research from other reputable institutions.⁷
 - **Key informant interviews** with 43 stakeholders comprising Senegalese businesses, entrepreneurs, government and non-governmental associations, government agencies, educational institutes, international development organisations, start-up incubators, commercial banks and mobile money operators, among others.⁸
 - **Crowding in expertise** from individuals and organisations already conducting research in Senegal and the role of digitalisation through four expert advisory group⁹ convenings and one industry stakeholder workshop attended by stakeholders who were engaged with during the project, in addition to MCF Senegal.
4. **A scenario pathway development** exercise that charts the impact of the digital economy across three of the four key sectors, varying by type of intervention, to produce estimates of additional jobs created based productivity/output-employment elasticities and the digitalisation transmission mechanism described above.

Report structure. This report is structured as follows:

- **Section 2** describes the key conceptual frameworks applied towards understanding the digital economy in Senegal, namely, 1) defining a digital economy, 2) the nexus between digital innovation and real economy outcomes, 3) the role of digitalisation in economic sectors, and 4) defining digitally enabled youths.
- **Section 3** provides an overview of the Senegalese context in terms of socio-economic drivers, the policy and regulatory landscape, and key digital infrastructural considerations.
- **Section 4** unpacks key insights derived from the qualitative and quantitative research among the youths in Senegal regarding their future desired state of work and the role of the digital economy.
- **Sections 5–8** analyse each of the respective prioritised value chains/sectors by assessing the contextual realities of the given value chain/sector, the role of digitalisation and the growth/employment opportunities it has the potential to catalyse. Each section also considers the risks of and mitigation strategies for achieving the identified opportunities and provides key recommendations regarding the role of MCF Senegal in unlocking the identified opportunities.
- **Section 9** discusses the key imperatives required to achieve the identified opportunities across the sectors, outlines the various scenarios under which opportunities could be feasibly and best realised, and estimates the likely employment impact under each scenario.
- **Section 10** concludes.

7 See the table of references in Section 12

8 See the stakeholder list of interviewees in Annexure 1.

9 See Annexure 7 for the composition of the study's expert advisory group.

2. Unpacking the key concepts

The guiding question for this study is: “How can the digitalisation of the economy contribute to the creation of dignified and fulfilling work for Senegalese youths?” Answering this question requires an understanding of the country context, the perspectives of the youths, and the dynamics of different economic sectors. The sections to follow consider each of these components in turn. Before doing so, however, it is important to set out the conceptual framework that forms the basis of the analysis. In this section, we introduce four conceptual models that underpin the remainder of this report:

1. First, we clarify what is meant by the digitalisation of the economy.
2. Then we consider the primary transmission mechanisms and digital tools through which digitalisation can contribute towards the creation of work at a macro level. This is a conceptual explanation for the sector lens that is applied in the remainder of the report.
3. Next, we apply a micro-economic lens to consider how digital innovation manifests itself across the operations of a specific value chain.
4. Finally, we outline a framework for analysing the perspectives of the youths. We do this by considering the steps or elements that lead to the creation of a digitally enabled youth cohort.

2.1. Defining the digital economy

No central definition. The digital or digitalised economy is a broad and nebulous concept without a well-established or widely accepted definition. The OECD, for example, defined it as “enabling and executing the trade of goods and services through electronic commerce on the Internet”. The European Commission’s Expert Group on Taxation of the Digital Economy (2013) simply defined it as “an economy based on digital technologies”. The digital economy and terms related to digitalisation are concepts that most people have an intuitive understanding of, but they are, in fact, often used to refer to quite different things. Section 0 below, for instance, shows how the youths in Senegal typically have a very narrow view of the digital economy as being that related to commerce via social media and digital platforms. Very few of them mention any of the facets of the core ICT sector.

Broad view of digitalised economy. To promote a fuller understanding of the employment dynamics associated with the digital economy, this study takes a broad view of the digitalised economy as defined by Bukht and Heeks (2017) and illustrated in Figure 1 below:

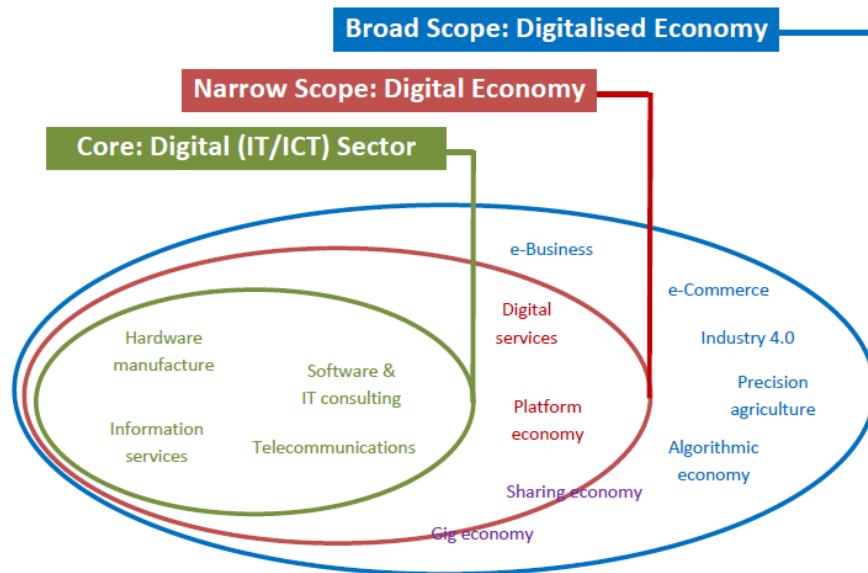


Figure 1. Scoping the digital(ised) economy

Source: Bukht & Heeks (2017)

Figure 1 shows three expanding levels of the digitalised economy:

1. At the core, the **digital sector** encompasses the developers and providers directly active in the ICT sector – those players developing and providing the underlying hardware, infrastructure and software upon which all digital processes and activities throughout the economy run.
2. The **digital economy** has a broader scope than the digital sector. It includes all those providers that produce and sell purely digital products or services, that is, products or services that are developed, sold, transmitted and used entirely digitally. The digital economy is therefore “that part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services” (Bukht & Heeks, 2017).
3. Finally, the **digitalised economy** refers to the application of digitalised activity and technology to economic activity. This is the broadest definition and it includes a consideration of how digital technology can enhance the efficiency and productivity of traditional economic activities. For instance, the use of digital technology to enhance agricultural productivity through precision agriculture.

Products and services that are purely digital essentially eliminate time and space, which means that providers of digital products are competing in a highly competitive, truly global market. Realistically, few Senegalese firms (and, in fact, not many African firms) are equipped (or can be equipped) to compete effectively in this market in the medium term. For this reason, the focus of this study is on the outer circle in Figure 1 in order to consider where digital innovation can enhance the productivity and value of Senegal’s existing immovable assets, as this is where the greatest opportunity lies for Senegal’s economy and society to benefit from digital technology. However, the inner circles relating to the digital economy and digital sector still remain within the broader digitalised economy and, indeed, are critical drivers of the digitalised economy. Therefore, whilst the majority of priority opportunities identified in this report do lie in the broader digitalised

economy, this does not exclude opportunities within the more narrowly defined digital economy. In the sector analyses in sections 5 to 8 we consider ways in which digital technologies can combine with Senegal’s existing endowments to increase economic output, drive growth and ultimately generate employment in the digitalised economy. In section 9, we then give more explicit consideration to the role of the digital economy as a key driver of these outcomes within the different sectors.

2.2. How digital innovation manifests in the creation of work opportunities and other real economy outcomes

Figure 2 below offers a simple illustration of our theory of the way digital innovation created in the digital economy translates into real economy outcomes via the individual sectors of the economy:

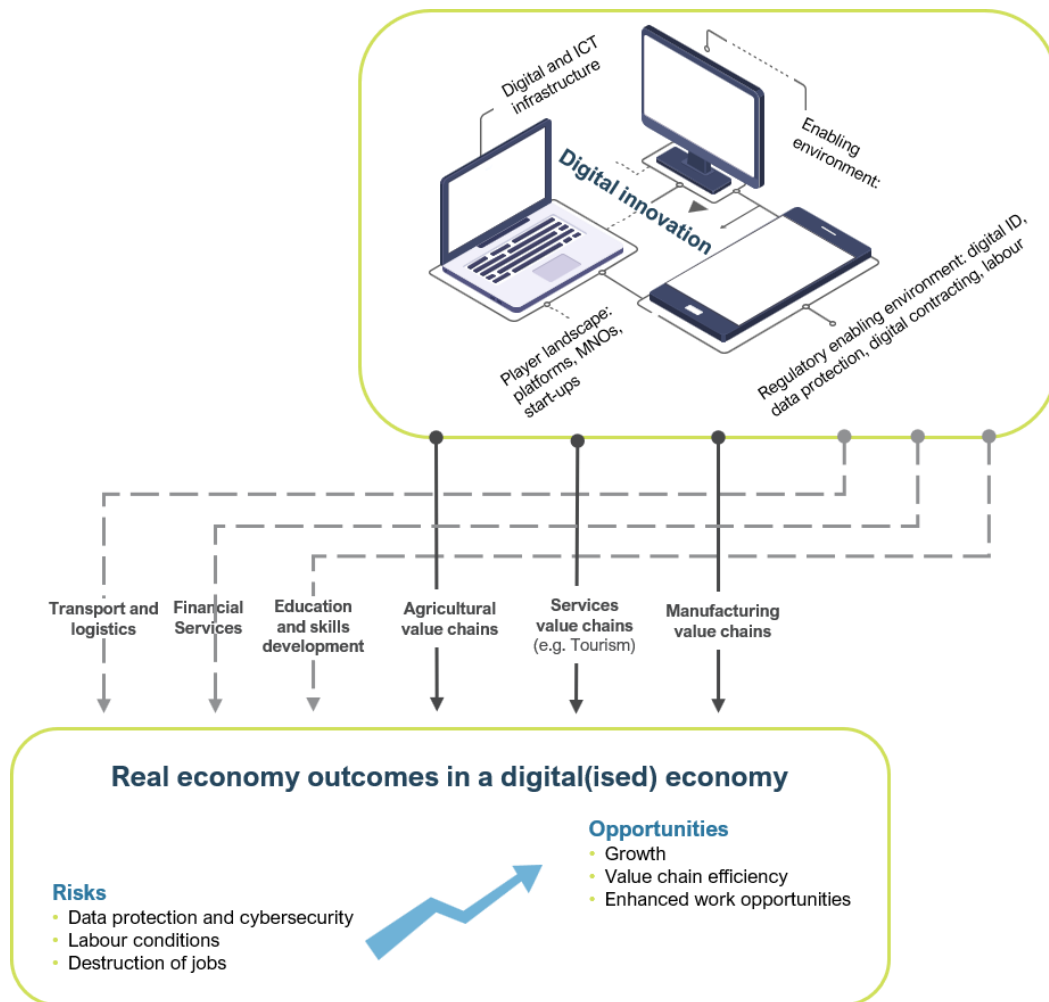


Figure 2. How digital innovation translates into real economy outcomes

Source: Authors’ own

Sectoral transmission mechanisms. The diagram depicts different sectors of the economy as the connectors between digital innovation and real economy outcomes. The theory of change is that the adoption of digital innovation by operators in specific economic sectors, such as agriculture or manufacturing, enhances the efficiency and therefore the productivity of the enterprises operating in those sectors. This leads to enhanced competitiveness and therefore growth in each sector. Growing sectors ultimately create more jobs – both by growing employment at existing enterprises and by creating opportunities for new entrants.

Cross-cutting sectors create multiplier effects. Figure 2 also depicts a number of indicative cross-cutting sectors in dashed lines. These are important sectors that warrant being given deliberate consideration. As with those discussed above, these sectors also benefit from digital innovation to enhance productivity, grow and therefore contribute directly to real economy outcomes (the reason for the connecting arrow to the real economy level). However, these sectors also play a critical supporting role in the development and productivity of other sectors and consequently they have a multiplier effect on outcomes across the economy.

The transport and logistics sector is a good example of this. Apart from being a direct source of employment, digital innovation such as tracking and telematics enables vastly improved fleet management. This leads to improved efficiency in the transportation sector, which in turn increases the speed and reliability with which agricultural and manufactured goods are able to reach markets.

General employment effects for existing firms and new entrants. The implication of this understanding of the transmission mechanisms in a digitalised economy is that the opportunities for creating dignified and fulfilling work for Senegalese youths in the digitalised economy lie in two main areas:

1. **Via existing firms:** By supporting greater efficiency and productivity, digital innovation can spur growth among established firms, resulting in the creation of more jobs in established businesses. Not all of these jobs would go to youths, but it is likely that digital skills will be a prerequisite for most of these jobs; therefore we assume that digitally enabled youth applicants will be favoured.
2. **Via new entry:** Digital innovation also creates opportunities for entrepreneurs and new entrants to enter and operate in the market by applying creative and innovative concepts and ideas. The pool of likely digital entrepreneurs is likely to be skewed towards youths in all societies.

Specific, but more limited, employment effects in the core ICT and digital economy. Digital innovation also creates direct work opportunities in the core digital sector and digital economy that form the two inner circles of Figure 1. However, these are likely to offer far more limited work opportunities for youths than the broader economic sector-level impacts:

1. **Via the digital sector:** The ICT sector also creates jobs directly. With the right support, it is likely that this sector can grow substantially in Senegal, creating jobs accordingly. For instance, the government's Digital Senegal Strategy 2025 is targeting the creation of 35,000 direct jobs. However, this sector is currently very small, and so even rapid growth would not translate into a large number of jobs, as illustrated by the relatively low target quoted above. For instance, the government's Digital Senegal

Strategy 2025 is targeting the creation of 35,000 direct jobs. In addition, as these are highly skilled jobs, it may be that a significant portion of work conducted in the local ICT sector will be done by non-Senegalese workers and non-Senegalese firms that bring their innovative ideas into Senegal¹⁰.

2. **Via remote gig work on digital labour platforms:** The digitalisation of activities enables remote gig work. For jobs or work activities that can be conducted entirely online, employers can consider workers situated anywhere in the world. In theory, this therefore opens up a potentially global job market for Senegalese youths; in practice, however, remote gig work is highly competitive as the labour pool is also global. The lack of skills, ICT limitations and language barriers mean that the opportunity for the Senegalese youths to tap into global gig work is probably limited. This assumption is consistent with the experience of remote gig workers across the continent (Bester, et al., 2020).

Not all outcomes from digital innovation are necessarily positive. As illustrated at the bottom of Figure 2, whereas digital innovation can translate into a number of positive effects, there are also key risks that arise which can undermine or detract from real economy outcomes. These are, notably:

- **Data protection and cybersecurity:** The risk of personal data exploitation and cybercrime are major considerations for sectors and individual enterprises in a digitalised economy. The increased digitalisation of enterprises and sectors makes them increasingly vulnerable to the theft of data and hacking. The theft and exploitation of personal consumer data creates a real threat to the privacy and liberties of individuals throughout society. Furthermore, this can also translate into a loss of trust in enterprises and service-providers that use or require consumer data.
- **A lack of labour protection:** Labour regulation does not yet make separate provision for online work or gig workers specifically. Instead, even in cases where platforms exert control similar to that of regular employers, gig workers are considered self-employed or contract workers, where the platform as digital intermediary is not responsible for the provision of social protection. Therefore, while digital innovation can create new work opportunities, many of these workers are not well protected against exploitation or poor labour practices (Bester, et al., 2020).
- **Destruction of jobs:** The efficiency gains from digital innovation frequently mean that fewer people are required to perform the same activities. Therefore, apart from generating employment via the transmission mechanisms outlined above, digital innovation can also lead to the destruction of jobs, particularly low or semi-skilled jobs. Automation in basic manufacturing processes is a good illustration of this dynamic. The primary implication of this is that the elasticity of labour creation is less than one: in other words, a 1% increase in productivity in a given sector translates into an increase in sector employment of less than 1%. Labour elasticity also differs substantially between sectors. Furthermore, historic labour elasticity may not be a good guide to future labour elasticity where digital innovation is adopted for the first time. Assessing the impact on jobs of the enhanced productivity that results from digital innovation therefore requires the local, regional and global trends that arise from digitalisation to be considered.

¹⁰ It is noted that Senegal is recognized for its local IT expertise in the region and that the Digital Senegal Strategy 2025 works to promote human capital and skills in the local digital economy.

2.3. How digitalisation can enhance business operations through a value chain

Figure 2 above illustrates that value chains are the primary transmission mechanism through which digital innovation translates into real economy outcomes. Digital innovation does so by improving the productivity of value chains and the individual enterprises in them. Figure 3 below unpacks the ways in which digital innovation can manifest itself in a value chain to enhance productivity and growth.

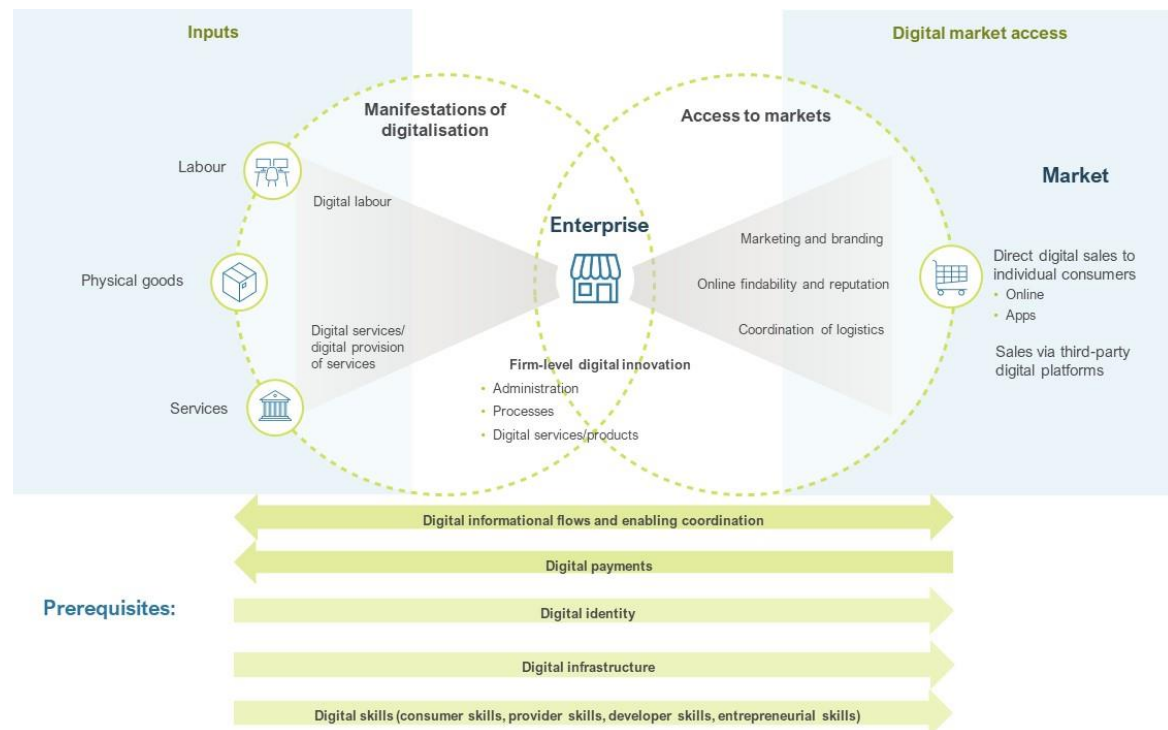


Figure 3. Opportunities from digitalisation in individual sectors

Source: Authors' own

Firm-level digital innovation enhances internal efficiency. At the centre of Figure 3 is the individual enterprise. The first, and possibly most well established, way in which digital innovation is adopted is directly by firms to improve the efficiency and quality of their internal administration and management processes. Some firms, such as those in the ICT sector, can also produce and sell digital products or services directly.

Digitalisation of input provision improves the ease and cost of access. On the left of Figure 3, the traditional inputs required by most firms are illustrated: labour, goods and services. Firms need to access these inputs as easily and cost-effectively as possible in order to maintain or improve the efficiency and productivity of their operations. Digitalisation can improve the efficiency of inputs in at least two ways:

1. **Digital labour:** Digital tools can improve the ease and lower the cost of accessing labour. Recruitment platforms help firms to find the right employees, whereas digital technology also makes remote work increasingly feasible for many jobs. This can be particularly important in accessing specialist or scarce skills that may not exist or be

easily accessible with Senegal, but which can be contracted from other countries and performed remotely.

2. **Digital service provision:** Many services can be accessed and used more conveniently and cheaply through digital channels. Financial services are a good example: whereas, historically, financial services such as insurance and credit or banking services could be accessed and managed only through direct in-person engagement with the service-providers, these can now all be purchased and managed entirely online¹¹ with far lower time and transaction costs.

Digitalisation unlocks substantial opportunities to reach customers. The other half of the value chain, on the right of Figure 3, considers ways in which the enterprise can sell its goods or services to consumers. Again, digitalisation plays a core role:

- **Transforming the nature of marketplaces:** Digital multi-sided platforms create online marketplaces that connect many sellers to many buyers. This offers individual firms the opportunity to reach a greater customer audience than only those that are geographically proximate. However, it also comes with greater competition as each firm is competing with many other suppliers in the same marketplace. As more consumers shift to online purchases and use digital platforms as the norm, this will become the primary channel through which consumers look for suppliers. Therefore, firms will need to adjust to changing consumer expectations and take their businesses online or risk losing customers. While this may not yet be the norm in Senegal, experience in countries across both the African region and the world suggest that this is likely to happen. Recent evidence also suggests that COVID-19 has triggered a spike in consumers' use of online marketplaces and platforms. The speed and nature of digital transformation will differ between different value chains and industries, based on a variety of factors, as discussed in depth in sections 5–8.
- **New ways of accessing and marketing to customers:** To reach customers who engage with products and services online, firms are required to transform the ways they conduct their marketing to consumers so as to ensure that they are “findable” by potential customers online. The opportunity to reach groups of new customers through effective online marketing and findability is substantial, but there are risks too: digital platforms tend to rely on consumer scoring of providers in order to build a ratings-based online reputation for providers. The implication of this practice is that the need for good customer service becomes an even greater and more immediate imperative in the digital economy.¹² In addition, for providers of physical goods, effective and efficient logistics becomes critical. Although typically online sales are far more convenient for consumers, a drawback of such sales of physical goods is that the product is not immediately received by the consumer, even though they have already paid for it. Slow or unreliable delivery can therefore quickly upset consumers and harm provider reputations – even when it is the logistics providers, rather than the seller/provider, who are responsible.

11 At least the digital technology allows for this. The existence of less innovative providers and regulatory restrictions means that in Senegal some form of in-person engagement is still required in practice.

12 A few bad customer ratings can undermine a provider's long-term reputation far more quickly and permanently than in the analogue world, where reputations spread via word of mouth.

Fundamental prerequisites. Finally, as illustrated at the bottom of Figure 3, a number of elements or building blocks are needed at the market infrastructure level for digital innovation to achieve the desired impact across the value chain. Digital infrastructure, digital payments, digital identity, digital information flows and user skills are all critical prerequisites for the digital evolution of value chains to take place.

2.4. What it takes for youths to be digitally enabled

Figure 3 above considers the provider side of the economy. But with the ultimate objective of creating dignified and fulfilling work for young women and men, it is also crucial to consider how individuals can be equipped to engage with digital tools and innovation. This requires an assessment of what it means to be digitally enabled and what is required for youths to become digitally enabled.

Defining digitally enabled youths. In the context of this study, “digitally enabled” is defined as an individual who is able to use digital tools to support their basic objectives or needs, whether that be to work, receive services or engage with a community. The term “digitally enabled” is therefore not a one-size-fits-all concept – youths are digitally enabled if they are able to use the necessary digital tools to achieve their specific and individual objectives or needs.

Steps towards digital enablement. Figure 4 below illustrates a simplified pathway towards unpacking what is required for youths to be digitally enabled. The figure is a simplified heuristic, but it is nevertheless useful in facilitating an understanding of the key prerequisites for individual young Senegalese to be able to use digital tools effectively to meet their needs.

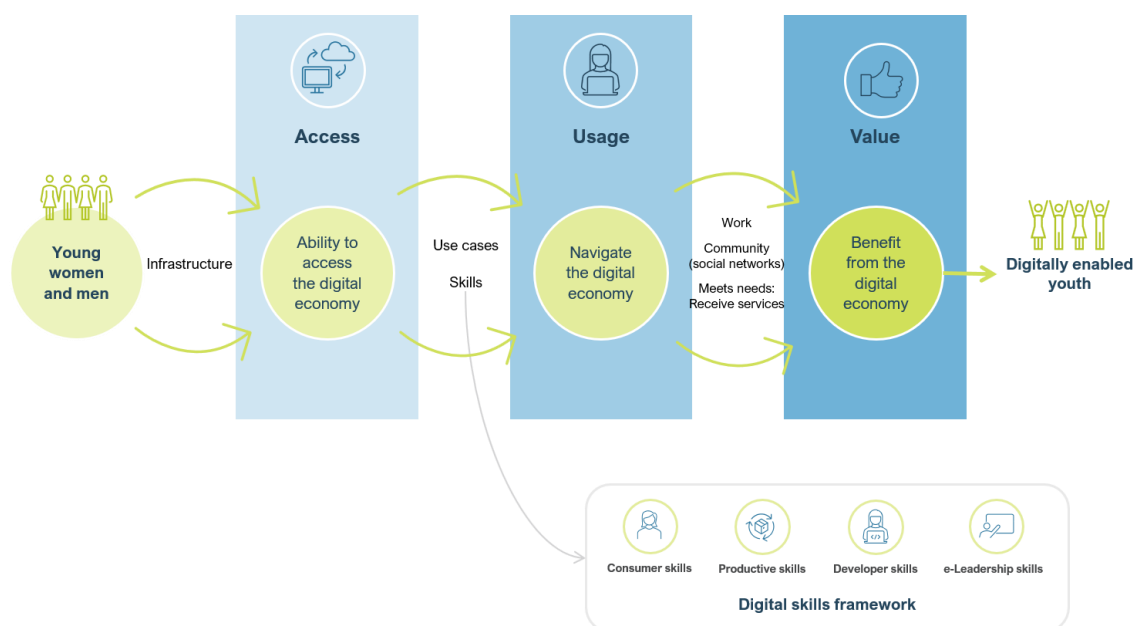


Figure 4. Visualising the journey towards enabling youths digitally

Source: Authors' own

The diagram indicates that for young women and men to be digitally enabled they need the infrastructure to enable them to **access** the digital economy. Then they need the skills to **navigate** the digital economy to serve specific use cases for them. Finally, through such usage/engagement in the digital economy, they need to derive **value** or benefit:

- **Access:** The first step in the pathway towards being digitally enabled is gaining access to digital tools. This requires individuals to have the requisite infrastructure to access the digital tools they need. In practical terms, this means being connected to core national, reliable ICT infrastructure as well as having access to personal hardware and software to meet their digital needs – which means having access to the internet as a baseline. But can also include access to specific types of device or software for specialised activities.
- **Usage:** Having access does not mean that individuals will automatically start using those digital tools. First, they need a reason to start doing so; in other words, digital-use cases need to exist that help individuals to meet their existing needs. Second, they need the skills to be able to use these digital tools. Digital skills are not one single set of skills, but, as outlined in Box 1, below, should be classified based on what the given individual is required to use digital tools for. It requires a completely different set of skills for someone to develop an e-commerce platform compared to simply purchasing goods from an e-commerce platform. Most Senegalese youths do not need the skills to develop an e-commerce platform, but most do need the ability to communicate and purchase goods and services online. Therefore, the digital skills required to use digital tools is, self-evidently, a function of the digital tools the individual needs to use.

Box 1. Unpacking the different categories of digital skills

Bester et al. (2020) identify four distinct categories of digital skills:

- *Consumer skills* are the capabilities that individuals need to function socially, economically and politically in a digital society. They enable the individual to be an effective consumer and citizen in the digital economy.
- *Productive skills* are the skills that individuals require to apply existing digital technologies for productive purposes. Productive skills enable individuals to use digital technologies to facilitate the production or the exchange of digital goods. These are the key skills required to be an effective employee or entrepreneur in the digital economy.
- *Developer skills* are those skills required to develop, customise or modify digital technologies and digital infrastructure. There are two levels of skills in this category: (1) the skills to develop entirely new digital technologies or infrastructure – for example, a new coding language or new storage technology; and (2) the skills to apply existing technologies to creating new applications for productive or recreational use. These skills form the core of the skillset young people need to shape the digital technologies that will affect their futures.
- *e-Leadership skills* are those skills required to conceive and execute business models to deliver public or private goods using digital technologies. These skills are strategic in nature. They speak to leading innovation in both the private and the public sectors. e-Leadership skills consist of competencies that combine an understanding of technology with the acumen to develop and implement business models and systems for productive use or public policy implementation. Individuals with e-leadership skills do not necessarily have to possess advanced developer skills but should possess the ability to provide strategic leadership in digital markets. They create opportunities for others.

Source: Bester, et al. (2020)

- **Value:** Finally, although individuals may use a digital tool, it does not necessarily mean that they derive value from it. For individuals to derive value from the use of digital tools, these tools need to meet the existing needs of the users effectively. Three broad needs are commonly met with the use of digital tools:
 1. **Work:** Digital tools can help Senegalese youths to find work through online job-seeking platforms and to enable individuals and enterprises across the economy to conduct their work effectively.
 2. **Community:** Digital tools, particularly social media, enable the formation and maintenance of online communities and social networks.
 3. **Accessing services:** Digital tools can enable individuals to access the services they need or desire more cheaply and conveniently than through traditional in-person engagement.

Value may be undermined by risks. When considering the value derived from digital tools, it is also critical to remain cognisant of the risks that can arise from the use of these digital tools. Individuals really derive value from digital tools only if they are not subject to significant or unsustainable risks as a result, be it from the exploitation of their personal

data, cybercrime or scams. These are real considerations, and, as illustrated in Section 4, tangible considerations for Senegalese youths.

This section has tried to provide a conceptual framing of digitalisation: defining what is meant by the digitalisation of the economy and then considering how it manifests in principle across the economy and society. The remainder of this document considers the ways these dynamics currently play out in Senegal, at the individual, enterprise, sectoral and national level. It also considers the likely trends in digitalisation over the next decade and where the corresponding opportunities and risks lie for the creation of dignified and fulfilling work.

3. Context and enabling environment

It is crucial to understand the country and the policy context that form the backdrop to the development of the digitalised economy in Senegal.

This section outlines the relevant context by considering the key policy or enabling environment elements needed for a well-functioning digitalised economy and by outlining specific regulatory challenges and gaps.

3.1. Components of an enabling environment for digitalisation

The existence of a thriving digital economy is based on solid principles or enablers that allow stakeholders to conduct business and interact with their governments and with one another responsibly and securely (CIPE, 2018). The specific enablers – laws, public policies, regulations and infrastructure – will vary depending on each country's needs and opportunities. Nevertheless, nine enablers, shown in Figure 5, are likely to be generally applicable to countries such as Senegal.

This section considers some of the indicators related to those enablers (as shown in Box 2), the status of those enablers for a digitalised economy in Senegal, and the way the country is dealing with their implementation.

Box 2. Key statistics for an enabling environment for digitalisation

Population: 16.3 million Senegalese, of which 48% are male and 51% are female. The rural population makes up 52%. The general life expectancy at birth is of 67 years (World Bank, 2021).

Mobile connectivity: Senegal's penetration of mobile connections is 110% (GSMA, 2021). The country has a 95% 3G coverage, 50% 4G coverage and by the end of 2020 companies had started trials to implement 5G in the country (GSMA, 2021) (AUC/OECD, 2021).

Internet penetration: The general internet penetration stands at 46%. The percentage of the population using the internet stands at just above 30%; only 34% of adults have a smartphone (Pew Research, 2017). The proportion of businesses with a website is 35% (AUC/OECD, 2021).

The percentage of households with a computer is 16%, and fixed-broadband subscriptions per 100 inhabitants stand at 0.7 (ITU, 2018).

Broadband costs: Mobile broadband prices are high for most Senegalese, accounting for 12% of average monthly incomes (World Bank, 2019). The mobile broadband penetration stands at 58% (GSMA, 2021).

Electrification: Senegal's electrification rate is around 66% nationwide; 92% in urban areas and 44% in rural areas (World Bank, 2021).

General ICT and connectivity indices: 41.3/100 – GSMA Mobile Connectivity Index (GSMA, 2021) and 142/176 in the ITU-ICT Development Index (158/176 for digital skills).

Mobile Money Issuance licence price: USD552,000 (BCEAO, 2017).

Average annual USSD codes usage tariffs: USD7,600 (ARTP, 2020).

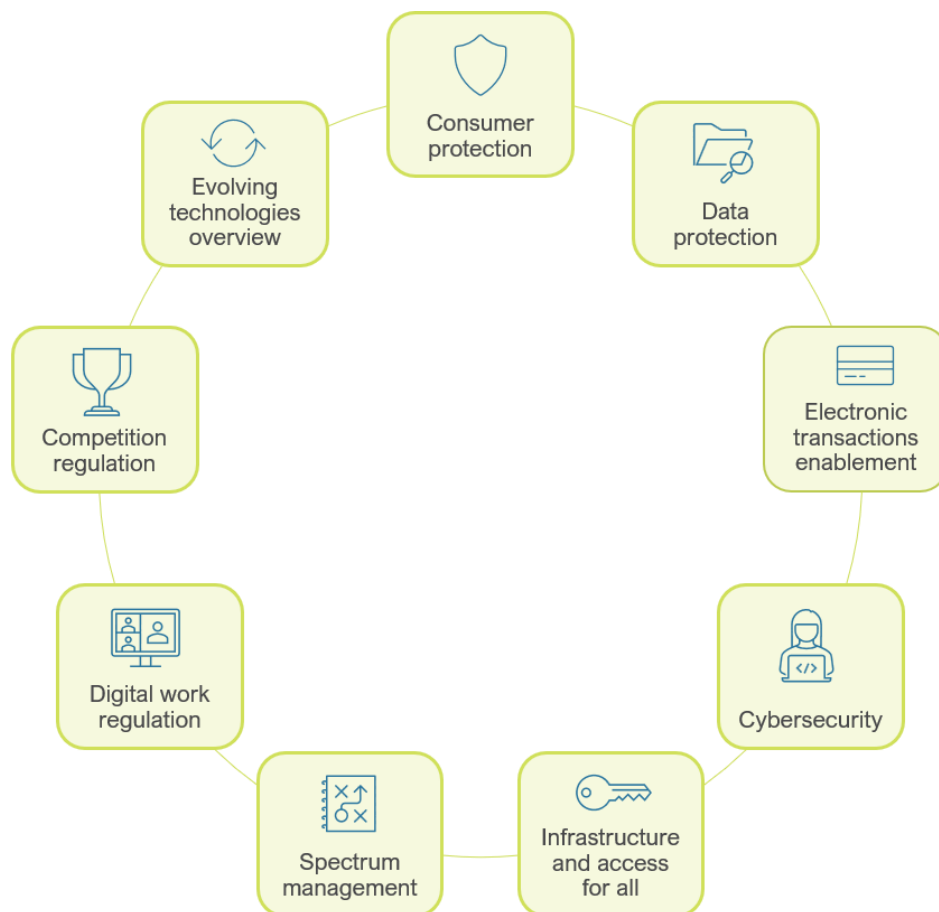


Figure 5. Components of an enabling environment for digitalisation

Source: Authors' own, based on (CIPE, 2018) and (World Bank, 2019)

Below, the status of each of the enabling environment elements in Senegal is considered in turn.

Consumer protection. Consumer protection laws should shield consumers from faulty or improperly described goods and services; such laws are therefore essential to fostering a trustworthy environment online (CIPE, 2018). Senegal does not yet have specific regulations in the digital services realm, including those regarding quality assurance of services, fraud prevention, dispute resolution, effectiveness of withdrawal periods, and processing personal data.

Data protection. Laws should regulate how data is stored, who is responsible for it, how “data subjects” consent to the use of their data, and how they can access, modify, or eliminate that data. Senegal has a [legal and institutional framework](#) for protecting personal data (Republic of Senegal, 2008); however, the enactment of broader regulation that addresses issues such as biometrics, big data, artificial intelligence, geo-location, and cloud computing is still pending. In addition, stakeholders are unwilling to share their knowledge and ideas since there is no practical intellectual property protection framework. This has resulted in a generalised lack of trust and cooperation between them (Stakeholder consultations, 2021).

Electronic transactions and e-commerce. Regulators must oversee banks and non-bank financial service-providers under an enabling regulation to foster online payments and transactions. The relatively low bank account and mobile money penetration rate in Senegal, as well as a lack of integration of Application Programming Interfaces (APIs) for online retail shopping payments (except for Orange Money), slow the sector's development. The UNCTAD B2C E-commerce Index¹³ positions Senegal in the 99th place of 152 countries (UNCTAD, 2020). But efforts have been made to adopt a National E-Commerce Development Strategy (OSIRIS, 2019). The rates of merchant acceptance of electronic transactions are low, especially in rural areas. Challenges continue to beset the expansion of the agent network, especially regarding a sustainable business case for agents.

Cybersecurity. The cybersecurity enabling environment includes having in place cybercrime legislation at the national and regional levels and guidelines for the private sector. Senegal has a well-implemented national cybersecurity strategy which caters for national cybersecurity and infrastructure improvement policies and the criminalisation of cybercrimes. It has also ratified the African Union Convention on Cybersecurity and Personal Data Protection, which establishes a “credible framework for cybersecurity ... through the organisation of electronic transactions, protection of personal data, promotion of cyber security, e-governance, and combating cybercrime” (African Union, 2020). Yet there is no strong emphasis on the implementation and coordination strategy between the Government and the private sector, a fundamental aspect of sound protection against cybercrime. Cybercrime may endanger Africa’s digitalisation because its online ecosystem is one of the most vulnerable in the world (AUC/OECD, 2021).

13 The UNCTAD B2C E-commerce Index measures an economy’s preparedness to support online shopping. The index consists of four indicators that are closely related to online shopping and for which there is wide country coverage: Account ownership at a financial institution or with a mobile-money service-provider (% of population ages 15+); Individuals using the Internet (% of population); Postal Reliability Index, and Secure Internet servers (per 1 million people).

Infrastructure and access for all. This enabler considers general connectivity, broadband infrastructure, affordability barriers for the uptake of digital services, and inclusion policies to develop digital skills. In Senegal, owing to the oligopolistic market structure, mobile broadband prices are high compared to those of other countries in the region and have decreased only marginally (World Bank, 2019). Notwithstanding the high mobile penetration, general internet access is still low. Stakeholders interviewed reported poor uptake of digital tools in areas away from Dakar and other urban areas with higher-than-average prices for data (Stakeholder consultations, 2021). In addition, the country faces issues related to net neutrality.¹⁴ The Senegalese telecommunications value chain remains tied up in bottlenecks. The affordability of access to mobile broadband represents a challenge as prices are still too high despite their recent decline (World Bank, 2018).

Spectrum management. Devices use the electromagnetic spectrum to transmit information wirelessly. Because of the scarcity and crucial importance of electromagnetic spectrum, ideally, regulation will have in place fair and efficient mechanisms for spectrum allocation and licensing new spectrum. Senegal needs to develop – and is aware of this need – a spectrum management policy that avoids concentration and allows spectrum trading, particularly in terms of the competencies and tools of the ARTP (Government of Senegal, 2017). Senegal’s spectrum management could also benefit from carrying out competitive tenders for spectrum assignment.¹⁵

Digital work and digital workers. Regulations should cover work done through digital labour platforms, specifically for short-term “gig” jobs. The potential for decentralising and internationalising employment brought about by the digitalisation of the economy may endanger companies’ fulfilment of basic national and international conditions of employment (Graham, et al., 2017). Senegal’s labour legal framework does not explicitly address digital work, but it is robust enough to be easily updated by adding specific provisions regarding digital and short-term work.

Competition/antitrust regulations. Competition authorities should regulate digital markets, interconnection of networks, infrastructure sharing, price regulations, licensing, and mergers to avoid excessive market concentration and anticompetitive bundling of services practices that may reduce competition (International Telecommunication Union and the World Bank, 2020). In Senegal, the dominance of Orange has caused issues regarding access to USSD channels by other financial service-providers.

14 Mainly since the Electronic Communication Code has been issued, including some questionable mechanisms that may allow the manipulation of the information transmitted online. Net Neutrality has been defined as the requirements “to prohibit payments from content providers to internet service providers ... a one-sided pricing model, in contrast with a two-sided pricing model in which such payments are permitted. Net neutrality may also be defined as prohibiting prioritization of traffic, with or without compensation”; without net neutrality requirements, “internet service providers might in some cases ‘throttle’ certain content, slowing down delivery of that content – or even blocking it – so that it would not cause congestion and hinder other kinds of service” (Shane, et al., 2016). In the context of Senegal, net neutrality concerns arise from article 27 of the Electronic Communications Code, which states: “The Regulatory Authority may authorise or impose any traffic management measure it considers appropriate to safeguard competition in the electronic communications sector and ensure the fair treatment of similar services” (ARTP, 2018). The provision enables the Government to intervene in internet traffic management without further control or regulations.

15 The new ICT law – Code on Electronic Communications – was adopted in December 2018, and three key decrees were also adopted; ARTP published two important regulation decisions (on the list of relevant markets and the list of dominant players) that are aggressive towards the incumbent. On the governance side, the *Conseil National du Numérique* (CNN) was created by decree and its 20 members have been nominated by the Prime Minister. On the competition side, two improvements are noteworthy: the entry of three ISPs in 2017/18, with two having already launched their services, and the attribution of 4G frequencies to TIGO in early 2019 (resulting in the introduction of competition on 4G).

Evolving technologies overview. An appropriate and flexible monitoring approach responds to arising technologies such as artificial intelligence (AI), cloud computing, cryptocurrencies, big data, and the Internet of Things (IoT). Senegal has established the National Digital Council (*Conseil National Numérique*) as a forum for private technology companies and authorities to facilitate national consensus and stakeholder mobilisation. The State Informatics Agency (ADIE) has participated in the digitalisation of governmental activities and services; however, there is no identifiable leadership in the Government coordinating the updating of regulation as technology advances.

Policy commitment to enabling environment improvements

The analysis above suggests that there are still many elements of the enabling environment that are sub-optimal. However, the Government is taking concrete steps to improve the enabling environment for ICT and the digitalised economy more broadly.

ICT has a central role to play in the national development plans. The national development plan, *Plan Senegal Emergent* (PSE), which is now in its second implementation phase (2019–2023) (Ministry of Finance, 2018), makes Information and Communications Technology (ICT) a prominent priority across the different sectors of the economy. In the ICT realm, the Government intends to implement interventions such as (i) strengthening training in ICTs; (ii) ensuring fibre optic coverage of the national territory; (iii) making high-speed fixed and mobile internet services available; (iv) promoting accessibility to ICT services; and (v) securing digital infrastructure, networks, and services.¹⁶ In this regard, the Digital Senegal Strategy, also a national development policy, derives from the PSE and is built upon four main axes: (i) increasing broadband connectivity penetration; (ii) connecting public entities; (iii) creating an environment for a digital private sector; and (iv) promoting digital resources to increase productivity. One of the main objectives of the development plans is to increase the internet penetration rate to 91% in 2023, compared to 62% in 2017, and to raise the proportion of the population using the internet to 46% in 2023 compared with 28% in 2017 (Ministry of Finance, 2018).

Special Economic Zones (SEZs) could potentially be hubs to boost the Digital Economy. The SEZs are designed to promote economic activity and offer appropriate infrastructure and services for businesses to develop. Businesses in an SEZ will benefit from tax and customs duties incentives and will also have access to free foreign currency transactions inside the areas. The SEZs can present a solution to infrastructure and digital payments issues (Ministry of Economy, Senegal, n.d.).

Despite these steps, a number of specific regulatory gaps remain, as outlined below.

¹⁶ This last one through the implementation of the National Cybersecurity Strategy (SNC2022).

3.2. Regulatory challenges and gaps

The coexistence of national and regional regulations makes it challenging to improve the environment for digitalisation. Senegal has enabled the fast creation of companies,¹⁷ reduced the tax load on new businesses,¹⁸ and opened Unstructured Supplementary Service Data (USSD) codes to non-Mobile Network Operators (MNOs). Still, the Central Bank of West African States' (*Banque Centrale des États de l'Afrique de l'Ouest* – BCEAO) regulations on banking, electronic money, and digital payments applicable in the West African Economic and Monetary Union (WAEMU) region impose cumbersome requirements on fintech and micro-finance companies to operate or have forced them to wait long periods for regional regulations to be issued (BCEAO, 2021). In addition, the fact that local laws and regulations must be built or structured around regional ones slows down the planning and implementation at the domestic level. Adapting institutional frameworks and issuing laws to incorporate the regional guidelines and regulations to the national framework adds an extra layer of complexity for creating a more enabling environment for the digitalisation of the economy.

The delay from BCEAO in issuing regulations undermines stakeholders' ability to implement digital products or solutions. BCEAO has ongoing regional projects to implement financial entities' interoperability and introduce Electronic Know Your Customer (eKYC) standards (BCEAO, 2017). However, the timelines for implementing these projects are not clear, and the potential content of the provisions is not shared with the stakeholders. This has produced an environment of uncertainty among the stakeholders consulted. As a result, they are left without tools to plan or initiate the development of possible digital products or solutions (Stakeholder consultations, 2021). Furthermore, having to coordinate the interests and concerns of decision-makers from eight different countries and their local stakeholders with the regional regulator delays the Digital Financial Services (DFS) policy-making process, particularly regarding cross-border interoperability.

Regional regulations limit innovation and DFS development. The national Government cannot legislate or act beyond the regional regulations. This has resulted in an environment that is hard for start-ups and investors to navigate because rules on interoperability and eKYC have not been issued by BCEAO. Furthermore, the high costs of licensing to become a mobile money issuer are forcing entrepreneurs to traverse an incomplete regulatory framework that is also costly to comply with, which reduces their ability to innovate in the sector (Stakeholder consultations, 2021). Finally, the regional prohibition on the free exchange of different currencies outside the banking ecosystem discourages fintech companies from implementing new services, forcing them to partner with banks to offer cross-border payment services. This reduces the opportunities for fintech companies to innovate or act outside the bank's own proprietary software and technology.

A complex institutional architecture creates inefficiencies in access to the digital environment. A complex institutional architecture in Senegal makes it difficult to reconcile or coordinate across the different elements needed to enable the digitalisation of the economy. There are a number of government ministries and champions for digitalisation in Senegal: National Digital Council (*Conseil National du*

17 Such as APIX Agency for the Promotion of Investments and Major Works (Agence de Promotion de l'Investissement et des Grands Travaux).

18 Start-up act.

Numérique – CNN), Regulatory Authority for Telecommunications and Post (*Autorité de Régulation des Télécommunications et des Postes – ARTP*), Delegation for Rapid Entrepreneurship (*Délégation Générale à l'Entreprenariat Rapide pour les Femmes et les Jeunes – DER*), Promotion of Investments and Major Works (*APIX*), and the Ministry of Communications, Telecommunications, Post and Digital Economy (*Ministère de la Communication, des Télécommunications, des Postes et de l'Economie Numérique – MCTPEN*). However, they lack a guiding axis or clear strategic leadership (World Bank, 2019) and, despite the *Plan Senegal Emergent* and the Senegal Digital Strategy general mandate, there are no integration protocols that recognise the interrelation between the different enablers of the economy's digitalisation. This results in a lack of policy consistency and harmonisation among public ICT entities (World Bank, 2019). The ARTP, as core ICT regulator, can be equipped to take on such a leadership role by guaranteeing its technical independence and facilitating its coordination with other national ministries and regulators as well as regional actors (Begazo, et al., 2017).

Stakeholders have identified a regulation and policy implementation gap. Laws and regulations are often not implemented due to the absence of execution mechanisms. While high-level regulations and laws are in place, lower-level regulation, and street-level institutional design, which are necessary to implement such provisions, are lacking (Stakeholder consultations, 2021).

Market dominance not adequately controlled. There is a strong dominance by Orange, Free, and Expresso in the telecommunications sector that the regulator has only partially dealt with. Notwithstanding the recent (2018) determinations by the ARTP regarding dominant operators in the mobile money market, a de facto monopoly of Orange in the 4G market still exists (World Bank, 2019). This has led to high data and mobile services prices (World Bank, 2019). However, its dominance is not as strong as in other markets in the region, which allows other actors a presence with relevant market shares. Improving the regulation of mechanisms to guarantee fair competition in the financial and mobile network sectors is fundamental to driving the growth of the Digital Economy, especially with regard to USSD access provision to financial service players. In conclusion, there is a need for competition authorities and legislators to play a more active role in influencing the Digital Economy positively.

The absence of regulation of mobile aggregators makes it harder for authorities and stakeholders to operate. The national Government is only starting to consider the possibility of regulating mobile aggregators to provide value-added services (ARTP, 2021). Mobile services aggregators present an alternative to working with MNOs individually and this reduces the price, difficulty, and length of the interactions with them. Regulating aggregators could be an effective way of resolving some of the interoperability issues between stakeholders and of improving accessibility to the services provided by the dominant MNOs in the market.

Uncertainty about digital contracting and identification. The 2008 law on electronic transactions¹⁹ and the electronic certification decree²⁰ aimed to regulate the certification and acceptance of e-signatures.²¹ However, there is an implementation gap between the regulations²² and the actual usage of electronic signatures for contracting due to the lack of a generally applicable electronic signature framework. The current framework leaves the management of electronic signatures in the hands of authorised certification bodies in the private domain,²³ and only a couple of companies have taken over this task.²⁴ The lack of a centralised system for electronic signatures has practically side-lined the use of e-signatures for digital contracting.

Digital ID implementation may accelerate the digitalisation of services. Senegal has a National Biometric Identity Card, which is mandatory for all citizens. Nevertheless, 25% of the population is not registered and the card currently has no online functionalities. This affects the fulfilment of KYC requirements to access DFS – which needs to be complied with by physically presenting an ID to a branch, with the branch having to keep a paper copy of the KYC files (Stakeholder consultations, 2021). Digital IDs can solve some of the identification issues online, particularly in rural areas.

An efficient banking system for the region, but not to connect to the world.

The BCEAO serves as the Central Bank for the eight West African countries that are part of the WAEMU,²⁵ including Senegal.²⁶ The BCEAO regulates the transfer of foreign currency in the community through banking institutions. Capital movements between a member state and a non-member state can be proceeded with only by entities that are allowed to operate a foreign currency conversion for coverage in West African CFA francs through the STAR-UEMOA system,²⁷ and these entities are mainly banks²⁸ (BNP Paribas, 2019). As only 20% of the population has access to a bank account and non-bank financial players are not allowed to access the system, there is a high cost for the general population in making and receiving low-cost transfers outside the WAEMU region (World Bank, 2019). Offering low-cost or zero-cost bank accounts that are interoperable with mobile wallets therefore has the potential to benefit cross-border commerce (Stakeholder consultations, 2021).

19 [Act No. 2008-08 of 25 January 2008 on Electronic Transactions.](#)

20 [Decree No. 2008-720 of 30 June 2008 on Electronic Certification.](#)

21 Article 42 of the Act No. 2008-08 of 25 January 2008 on Electronic Transactions provides that “an electronic signature created by a secure device that the signatory can keep under his exclusive control and which is based on a digital certificate is accepted as a signature in the same way as an autograph signature”.

22 The Government of Senegal has also signed but not ratified the United Nations Convention on the Use of Electronic Communications in International Contracts (New York, 2005).

23 Article 18 of the Decree No. 2008-720.

24 Gainde2000 and Sentrust.

25 Benin, Burkina Faso, Côte d’Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo.

26 It issues the single currency for the union, manages monetary policy, organises and monitors banking activities, acting as the de facto regional banking regulator, and is responsible for the functioning and supervision of the diverse payment systems in the region. Senegal has joined STAR-UEMOA26 and SICA-UEMOA26, two of BCEAO’s regional banking clearing and settlement systems. Another relevant platform in the region is the GIM-UEMOA, an interbank and interoperable retail payment switch system for credit and debit cards based on chip technology.

27 The XOF may not be used for the settlement of current or capital international transactions with countries outside the WAEMU (BNP Paribas, 2019).

28 Other eligible participants are BCEAO, financial institutions, the Central Depository/Settlement Bank of the Regional Stock Exchange (BRVM), the UEMOA Interbank Monetary Group (GIM-UEMOA) and the Bank West African Development (BOAD).

Limited interoperability a major barrier. Senegal's digital financial services have limited interoperability. Some payment points are interoperable only through the card payment network, regionally through GIM-UEMOA, or internationally via VISA and MasterCard platforms (World Bank, 2019). The BCEAO took steps to set up comprehensive account-to-account interoperability by 2020 through the GIM-UEMOA platform. However, as at May 2021, no regulations have been issued in this regard. The objectives of this broader interoperability project are to (i) enable transactions between any digital devices (such as mobile wallets, online accounts, and bank and prepaid cards) to be interoperable and (ii) enhance mobile-to-mobile interoperability in the region and across borders (World Bank, 2019). Complete account-to-account interoperability, especially between banks and mobile money operators, can reduce costs and increase competition in the sector. It has been pointed out as being one of the primary enablers of the digitalisation of the economy (Stakeholder consultations, 2021).

4. Youths in the Digital Economy

This section will present perspectives obtained from youths in Senegal. It draws on focus group discussions (FGDs), in-depth interviews (IDIs) and a quantitative survey covering male and female youths, defined as being aged 15–35²⁹ years, and residing in urban, peri-urban and rural areas³⁰ rolled out in Senegal from March to May 2021.³¹ Based on these initiatives, this section aims to give Senegalese youths a direct voice in the analysis – referenced as Youth Insights (2021) for the remainder of this report.

The section starts with an overview of the youths' perceptions and expectations of work. After that, the analysis follows the digitally enabled framework introduced in Section 2: it considers access, usage and value in order to understand and locate the potential for youths in Senegal to derive value from the Digital Economy.

4.1. Perceptions and expectations of work

Despite formal employment ideals, job-seeking youths are becoming discouraged.

The research suggests that Senegalese youths tend to associate formal employment with prestige, viewing it as the natural next step following tertiary education. The youths have a collective desire, enhanced by a noted cultural aversion to risk, to seek the security that formal employment offers. Having said this, persistently high unemployment rates, exacerbated by COVID-19 and those especially among graduates, are discouraging youths from seeking traditional employment opportunities. These factors are giving rise to disillusionment with higher education and formal labour market ideals.

Entrepreneurship now has a higher appeal than employment. For the youths, fulfilling work hinges on their ability to earn an income and support their families. Consequently – and largely out of necessity due to recent pressures in the formal labour market – the appeal of entrepreneurship has grown. Overall, 88% of the youths surveyed reported that entrepreneurship appeals very much, while only 58% of the group said the same for employment. Those with a primary school education or Koranic education found entrepreneurship to be significantly more appealing than employment. The trend towards entrepreneurship was present across all demographics. Notably, 90% of young women found entrepreneurship highly appealing – which was more than that of their male counterparts (85%).

29 The definition of youth is 15-35 years, while the actual sample drew on youth from 16 years of age.

30 300 youth and 80 stakeholders across regions of Dakar, Thies, Kaolack, Touba and Saint-Louis.

31 See Annexure 2 for an overview of the methodology and sampling.

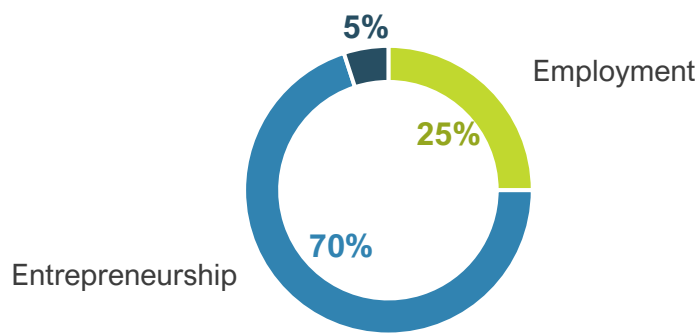


Figure 6: Types of opportunity the youths are interested in

Source: Youth Insights (2021)

A growing appetite for work in the Digital Economy. Given the pervasive appeal of entrepreneurship, youths are increasingly looking for business opportunities in the Digital Economy. These opportunities are perceived as effective and fast ways of earning an income – especially in online retail and last-mile delivery. When asked which areas they consider most attractive to start a business, trade in fast-moving commodities had the highest appeal rate of 64%. This trend is at least partly driven by factors of necessity, such as the need to earn an income and support a family in the absence of formal employment alternatives. Consequently, youths have found themselves doing work that does not necessarily fulfil their career aspirations:

“Many young people do jobs they don't like because they simply couldn't find a job in their field of expertise, which is why many of them do online sales or deliver jobs”

– male (25), job seeker.

Youth value benefits of entrepreneurship in the Digital Economy. Beyond factors of necessity, there are a number of motivating factors that also appear to be attracting Senegalese youths towards entrepreneurship in the Digital Economy. There is a perceived ease of making money through digital platforms, where 80% of the youths believe that platforms offer business owners greater access to customers. Consequently, entrepreneurship is becoming seen as more profitable than employment. Moreover, 82% of them believe that digital platforms can facilitate greater idea sharing and creativity for business owners, while 83% see digital platforms as providing greater opportunities for business mentorship and advice. Entrepreneurship is also perceived to be less stressful, with youths reporting that negative employment experiences have tainted their desire to seek jobs. Generally, youths are increasingly wanting to be independent; they want to work and live on their own terms. Digital entrepreneurship is perceived to cater to these desires.

A narrow understanding of the Digital Economy. The research suggests that the youths have a narrow conception of what constitutes the Digital Economy. To them, it almost exclusively represents social media and e-commerce platforms, based on what is mostly seen in daily life. This is because the youths see the Digital Economy as a way of

making money by using the internet: *“It is the money you earn through social networks.”* As can be seen in Figure 7, most youths are not yet exploring opportunities for learning and development about new products and services that can be leveraged from the Digital Economy. Only a small portion of the youths are using digital work tools and learning platforms, while most are engaging through social media and e-commerce platforms. This implies that the youths are limited in the way they use the Digital Economy to find work or grow their businesses.

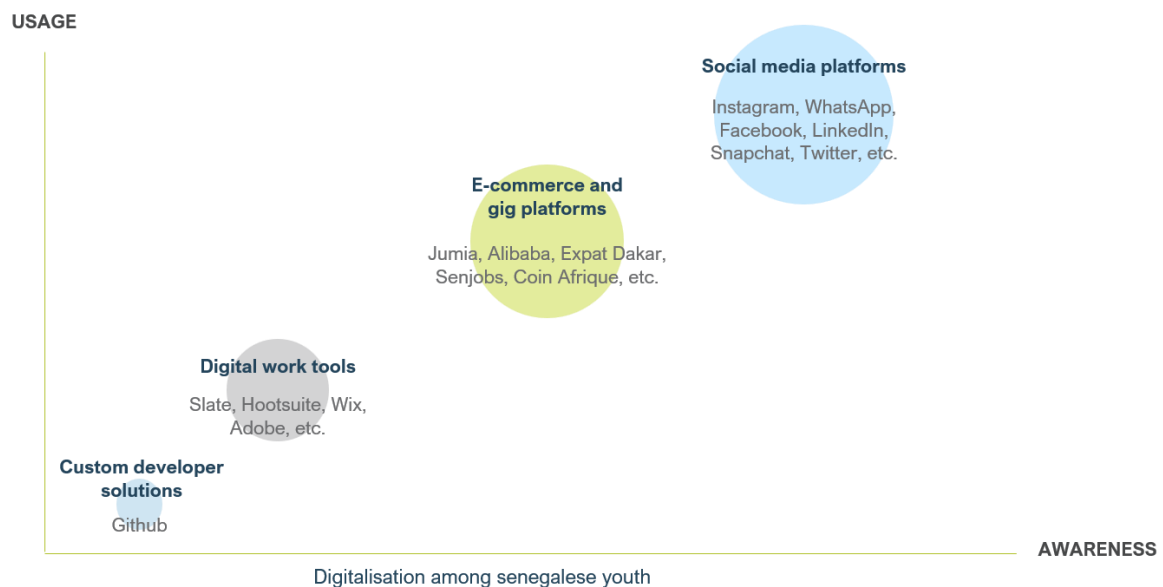


Figure 7. Youth awareness and usage of the Digital Economy

Source: Youth Insights (2021)

Value from working in the Digital Economy will hinge largely on long-term fulfilment and skills. Ultimately, youths desire fulfilling work in the Digital Economy. Optimistic about digital innovation, they aspire to working in the Digital Economy in ways that match their skills and interests. There is a willingness to engage in the Digital Economy – with youths highlighting robotics, AI and cryptocurrency as areas of interest – but they are not equipped with the skills to do so:

“For me, technology is the basis of everything. So, we must prepare young people and train them well for tomorrow”

– male (16–18), job seeker.

Fulfilling work will need to incorporate notions of “Teranga”. When asked what gives Senegalese youths pride, “Teranga” – the notion of warmth, openness and generosity – is frequently highlighted. Family, peace and stability are key themes that the youths treasure. Accordingly, work that gives youths a sense of community and allows them to support their families will be key features that create “value” in an occupation.

4.2. Access

The Digital Economy is broadly available to Senegalese youths. According to Figure 8, 95% of the youths surveyed have access to electricity and a mobile phone. Yet only 39% of them reported having access to a laptop or a personal computer and only 26% of have internet at home, which may limit productive use cases for digital tools. Nonetheless, mobile phones provide a key access point to the Digital Economy for the majority of youths, signalling that basic digital infrastructure is broadly available to them.

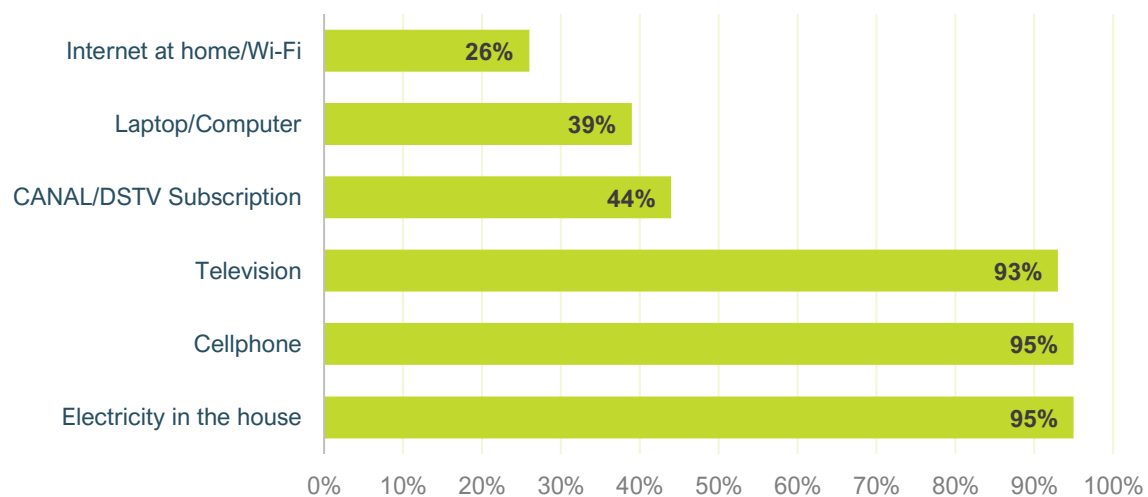


Figure 8. Household access to digital infrastructure

Source: Youth Insights (2021)

Mobile phones used for internet access. As can be seen in Figure 9, 99% of male youths and 100% of female youths reported that their mobile phone was their primary point of access to the internet. While mobile phone access is relatively similar across genders, male youths access the internet through a home or work laptop more than their female counterparts. Unsurprisingly, access through a laptop is also reported to be higher in Dakar and Saint-Louis than in other regions. Notably, the Touba region shows the lowest use of laptops as primary internet access points – with 0% of home laptops and only 1% of work laptops being primary internet access points. The regions of Thies and Kaolack, although having higher rates of primary access through laptops than in the Touba region, exhibited roughly half of the laptop access rates shown in Dakar (15%) and Saint-Louis (18%). Across all regions and demographics, internet cafés and learning institutes were the least used points of internet access for youths.

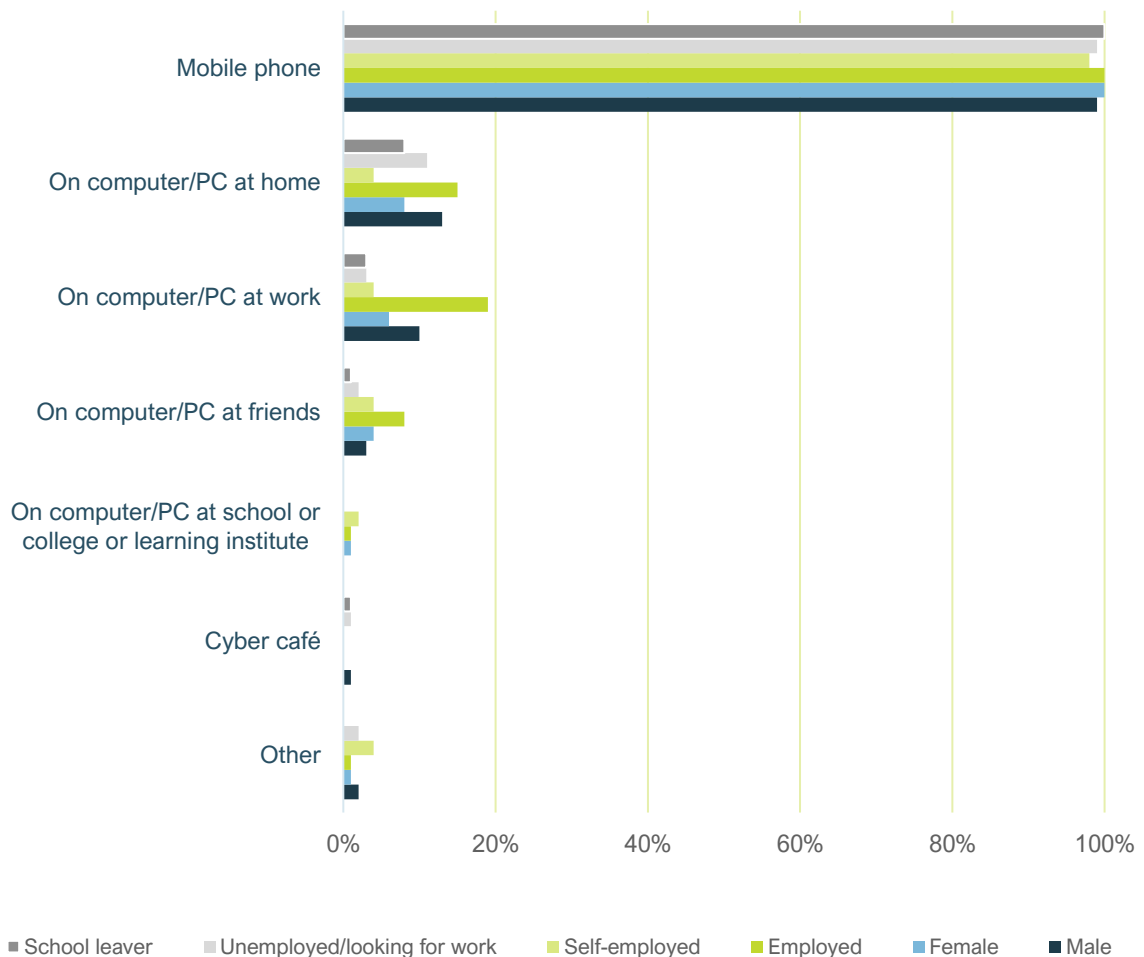


Figure 9. Primary point of access to the internet

Source: Youth Insights (2021)

Marginalised youth still fall behind despite improvement in digital access. An interview with a school leaving male revealed that youths with disabilities are largely excluded from society, yet digitalisation provides an opportunity for greater integration, where disabled youth “can earn a living through network marketing, digital or social networks.” This sentiment reiterates research findings from the United Nations that notes the potential of digitalisation, through greater access to information and digital communication, to bridge the divide between non-disabled and disabled youths (2016). Having said that, recent findings from the GSMA highlight a large gap in mobile phone ownership between disabled people and the non-disabled (2020). These findings are concerning for the case of Senegal, where more than 700,000 individuals are blind or visually impaired and, in 2013, 35,369 children were estimated to have disabilities (Fsadni, 2017; Handicap International, 2013). Displaced populations constitute another marginalised group with limited access. Globally, refugees are 50% less likely than the general population to have an internet-enabled mobile phone (GSMA, 2017). Although 14,059 refugees in Senegal were living in areas with at least 2G coverage in 2016, connectivity costs, language barriers and low digital literacy remain significant obstacles to access for refugees living in areas covered by mobile networks (United Nations Refugee Agency, 2016; GSMA, 2017).

Connectivity costs are the most pervasive barrier to youth access. Although youths broadly have access to the Digital Economy, the cost of connectivity, the quality of that connectivity, and the cost of digital devices are reported to be major barriers. Slow connectivity to a desired website was reported as being the most prevalent challenge (74%), whereas having insufficient data bundles was the second most prevalent challenge to accessing the Digital Economy.

4.3. Usage

Most youths use the internet daily. Overall, 84% of the youths surveyed use the internet daily. Age and region are significant predictors of this frequency: 91% of 25–30-year-olds use the internet daily, whereas only 78% of 18–24-year-olds report daily usage. Similarly, a rural–urban divide in usage frequency is seen, because 86% of those in urban areas report daily usage, yet only 63% of those in rural areas exhibit the same frequency.

WhatsApp is the most frequently used digital application in Senegal. Some 87% of youths use WhatsApp daily, indicating that the platform offers the most immediate value to them. Social media platforms Facebook (70%), YouTube (65%), TikTok (42%) and Instagram (30%) are the next most frequently used.

Youths mainly use the internet to connect with friends using social media.

The research suggests that a limited understanding of the Digital Economy restricts usage, as engagement is directly informed by what youths see most in their daily lives. Some 97% of youths reported often using the internet to engage with friends on social media, 68% often use the internet to watch video content and 41% often use the internet to listen to music. Youths therefore seem to be using what is easily available in the Digital Economy to complement their social and entertainment needs rather than proactively using digitalisation to transform their work and actions for efficiency gains and innovation. Only 24% of them report using the internet often for learning purposes and 14% often use the internet to advertise their own products or ideas. Consequently, the youths are failing to identify opportunities from digitalisation such as improved business administration, product and service innovation, and skill enhancement.

Social media rather than dedicated job-seeking platforms are used to find work.

Despite digital platforms having made it easier for youths to share their résumés and access job opportunities, LinkedIn and Senjobs are among the least used platforms – with 84% and 83% of the youths never using these applications. LinkedIn is often cited as a digital tool that has made it easier to network for employment purposes, yet youth engagement with the platform is low – only 6% used LinkedIn to find a job and only 1% used it to grow their business. Again, the preference is to leverage social media platforms. This is reflected in Figure 10, where WhatsApp is the most used platform for both finding a job (53%) and growing business operations (55%). Facebook is the second most used platform in this regard, with 51% of youths using the platform to find a job and 45% using it to grow their business. These use cases imply that social media platforms are being used to facilitate most youths' internet activity, whereas platforms tailored to specific purposes, such as job-seeking, are less popular.

<i>Applications</i>	<i>Aware</i>	<i>To find a job</i>	<i>To grow business</i>
WhatsApp	99%	53%	55%
Facebook	96%	51%	45%
Google	83%	33%	23%
Instagram	82%	12%	13%
Snapchat	73%	4%	5%
Jumia	67%	6%	13%
Twitter	59%	3%	4%
Alibaba	37%	2%	4%
Expart Dakar	34%	12%	7%
Senjobs	34%	15%	3%
Linkedin	26%	6%	1%
Coin Afrique	12%	0%	0%
Booking.com	9%	1%	0%
None	1%	19%	29%

Figure 10. Youths' usage of applications

Source: Youth Insights (2021)

The high visibility that social media offers makes it viable for online retail. As social media platforms facilitate most youths' internet activity, it is understandable that selling products online through social media platforms has become a way for youths to make money in the Digital Economy, as the following quote from a focus group discussion illustrates:

"I'm part of a group [on WhatsApp] that publishes bags, shoes, clothes and I put it in status and then if I have a customer I go to Colobane and collect the article and deliver it, then I collect the money and take my profit and give the money to my supplier"

– female (21), self-employed.

Online retail is particularly viable for the youths, as online sales have relatively low barriers to entry. In addition, courier and delivery services, which complement these activities, have become an opportunity for youths to earn an income during COVID-19.

Young women seem to be more willing and eager to engage with the Digital Economy. Given the rise in online retail, young women are eager to engage in the Digital Economy and believe that digital work provides a key opportunity for gender equality. Women with low education levels can acquire new skills online that enable them to earn an income. Young men, in turn, believe that women have a distinct advantage in the Digital Economy, as women are better suited to online commerce and are considered more trustworthy.

Digital tools used by marginalised youths as a tool for empowerment. Findings from focus group discussions reveal that individuals with disabilities are able to, and do, use digital tools to engage socially and productively with others:

“There is a stigma against disabled people...” “...disabled people can use digital technology for their purposes.”

– FGD participant (21-35), digital platform user.

Although research on the use of the digital economy by those with disabilities is limited to date in Senegal, evidence from studies by institutions such as the UN do note improved engagement from blind people who report being able to use text to speech applications to overcome their disability (United Nations, 2016). Another marginalised group that digitalisation can be used to empower is young migrants and refugees. In Jordan and Turkey, mobile phone ownership and online platforms are allowing refugees to become better connected, while Jesuit Refugee Services report success in their pilot work bringing tertiary education to refugees in Kenya and Malawi through online learning programmes. Moreover, the use of mobile money for cash transfers has become an important avenue for refugee assistance in Rwanda. Here, refugees appear to be regular users of mobile money and they are also able to work as mobile money agents (GSMA, 2017).

Below, we consider the specific insights regarding Digital Economy usage that arise for each of the focus sectors, followed by a discussion on usage challenges.

4.3.1. Sector specific insights

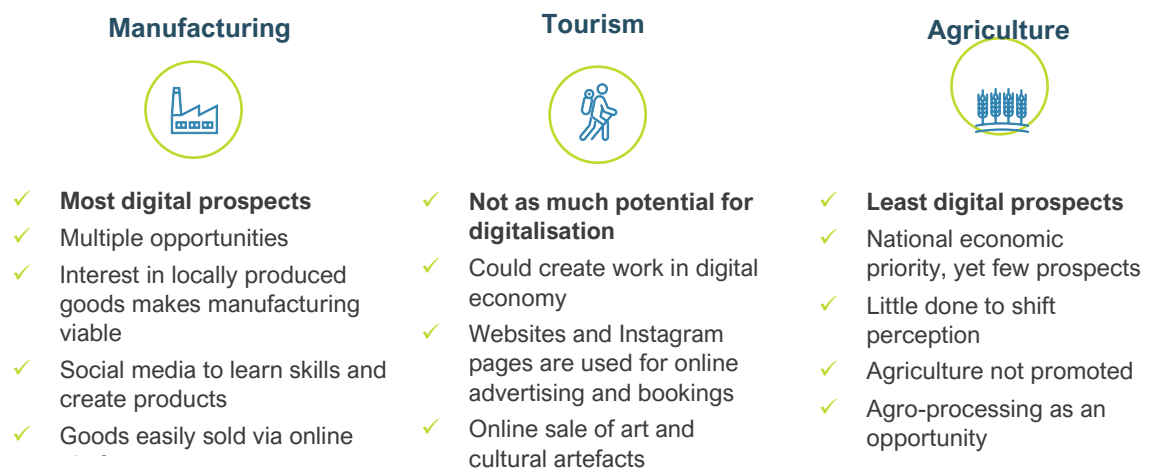


Figure 11. Snapshot of insights per sector

Source: Youth Insights (2021)

Manufacturing is perceived to have the best prospects for employment in the Digital Economy. The youths see manufacturing as providing the best work opportunities in the Digital Economy, largely because opportunities are highly visible through social media. Social platforms enable youths to see people advertising their manufactured products online, making opportunities appear real and tangible. Consequently, they have the highest interest (23%) in pursuing a career in the manufacturing sector. That being said, manufacturing – particularly that of fashion and apparel – ranks marginally lower (32%) relative to commodity trade (64%) and agriculture (49%) regarding attractiveness for starting a business. Nonetheless, the youths have identified that locally manufactured goods can easily be sold through social media and that interest in locally produced goods makes the sector increasingly viable. Notably, the youths are choosing to use WhatsApp (55%) and Facebook (45%) instead of Instagram (13%) or e-commerce sites such as Jumia (13%) and Alibaba (4%) to grow their businesses. The fact that they are not using platforms specifically tailored to selling locally made products suggests that they are again falling to leverage the benefits of the Digital Economy fully.

Women specifically find opportunities in textiles and apparel to be appealing. Entrepreneurship opportunities such as fashion design and dressmaking have been highlighted by female youths as being viable and appealing. Online training makes it increasingly viable for women to gain manufacturing skills, whereas women with existing sewing skills want to leverage them and enter the industry. A 21-year-old female looking for work explained how she used online learning to start manufacturing:

“I did the fashion design training so I learned how to make necklaces so I can make them and post them on digital platforms.”

Box 3. Identified opportunities in textiles and apparel for young men and women: youth survey insights

- **Manufacturing**

Fashion design and merchandising had a higher appeal rate for women (34%) than for men (28%).

- **Marketing**

- Digital marketing was more attractive to young men (25%) than to young women (15%).
- Make-up artistry and cosmetics were more attractive to women (34%) than to men (18%).
- Hair products and artistry were more attractive to women (23%) than to men (16%).

- **Online store management**

Trade in fast-moving commodities was more attractive to women (67%) than to men (58%).

- **Distribution**

Transport – courier logistics, shipping, delivery – was more attractive among men (17%) than among women (13%).

Tourism is perceived to provide fewer opportunities than manufacturing. Only 5% of the youths reported having a desire to pursue a career in tourism. This could possibly be due to a lack of visible opportunities to those not already in the industry. Failing to visit a particular website or Instagram page means that opportunities go unnoticed by the youths. Furthermore, since they are not engaging with platforms directly tailored to tourism, they will be unable to locate opportunities. Only 9% reported being aware of Booking.com, whereas 0% used the platform to grow their business. Regarding gender, tourism was even less appealing among young men (2%) than young women (7%). By age, tourism was the most appealing (7%) among 18–24-year-olds. Focus group interviews with male youths aged 16–18 years revealed that the younger age group is indeed relatively optimistic about work opportunities in the sector:

“Young people can be tour guides and there are plenty of other activities, even in catering.”

Agriculture is perceived to have the least prospects for digitalisation. The youths recognise that agriculture is a national economic priority, yet it is considered to offer few prospects for job creation in the Digital Economy. Nonetheless, agriculture continues to attract youths, because 49% of them would consider starting a business in the sector. Perceived limitations of digitalisation stem from the fact that urban youths associate agriculture with hard manual labour (often seen as being performed by older generations) and low returns. Some associate farming with low incomes, rural living and hardship and believe that little has been done to favourably change the youth’s perception of agriculture. A rural–urban divide is seen when comparing the attractiveness for starting a business in farming across regions. In contrast to Dakar (29%), respondents in Touba (65%), Thies (65%), Kaolack (78%) and Saint-Louis (82%) exhibit markedly higher interest in agriculture. But despite higher rates of farming attractiveness outside of Dakar, the youths do not recognise the enormous value that digitalisation may offer the sector by modernising farming practices – which multiple studies have shown. There is therefore a disconnection between what could be and what the youths understand and see:

“I think we need to create an application that will increase the visibility of agriculture”

– FGD participant (20–25), job seeker.

The youths do see employment opportunities in agro-processing. While the research did not pick up, among the youths, an appreciation of innovative opportunities surrounding farming, agro-processing is seen as a viable opportunity in the Digital Economy. The respondents see an opportunity for value addition of food products through natural juice processing, spices and peanut processing. This is particularly true among the older youths and those in the Kaolack region, potentially indicating that older youths outside of Dakar have more exposure to the downstream opportunities arising from agriculture. Urban youths may be increasingly alienated from agricultural practices and subsequently fail to see opportunities for value addition when they arise.

Education is seen as the primary enabler of youth engagement with the Digital Economy. The youths want to engage with the Digital Economy, but they do not have the skills to do so. In focus groups with 16–18-year-old males it was stated that “*without education, you can’t do anything on this list whether it’s agriculture, tourism and manufacturing*”. In the case of both agriculture and manufacturing, lacking basic training was highlighted as one of the primary barriers driving exclusion. Women in particular face low levels of education and literacy:

“Most women who sell online know how to handle a phone but can’t express themselves ... Like when they [women] post an article, they have trouble writing the words to describe the product”

– FGD participant (20–25), job seeker

Education can grow and reach a wider audience due to the rise in online learning from C-19, where e-learning platforms can boost learning outcomes for students and individuals looking to upskill themselves. Online lessons in religion and culture also present attractive opportunities for youths and women, given that women are typically encouraged to enter religious education. Religion and cultural learning therefore present linkages for digital value addition to education.

4.3.2. Usage challenges

Women face specific barriers to using the Digital Economy. The research suggests that culture and gender roles heavily influence the way young women perceive opportunities they can pursue in the Digital Economy. Owing to cultural obligations at home and early entry into marriage, young women are more likely to drop out of school. A son’s formal education is generally prioritised over that of a daughter, whereas religious education for girls is considered more important. Low levels of education mean that women lack training in the use of digital devices. This in turn limits usage.

A lack of hard skills may inhibit meaningful engagement with the Digital Economy. Senegalese youths have soft skills but they lack hard skills. When asked to identify their top skills, 73% of the youths reported “good communication and confidence”, followed by “teamwork and collaboration” and then “problem-solving skills”. Only 15% of youths reported financial awareness and literacy in addition to digital awareness and literacy to be among their top skills.

4.4. Value

Usage as indicator of value. The value that the youths derive from the Digital Economy is determined by the extent to which they make use of it. Therefore, the high internet and social media usage as outlined in Section 4.3 is an indicator of the value derived from the digital engagement. The internet usage figures suggest that urban youths and those aged 25–30 years are currently deriving more value from the Digital Economy than their rural and younger counterparts.

More social than economic value. However, as also outlined in Section 4.3, not all digital usage is leveraged for income-earning purposes: there is a heavy skew towards social-media engagement. Any value derived from e-commerce platforms is limited, as only 3% of the youths reported using the e-commerce platform Jumia daily and 63% of youths reported never using it. The youths are therefore deriving value from only a small portion of the available digital tools.

Young women and employed youths are key groups gaining from the Digital Economy. Young women seem to be more active users of the Digital Economy than their male counterparts. Women are more likely to use the internet for social media (98%), online buying (22%) and selling (16%) as well as learning new skills (26%). Only 20% of men use the internet often to learn new skills, 11% to sell their own products, 19% to purchase goods, and 96% to connect on social media. In addition, employed youths are seen to be deriving more value from the Digital Economy than those seeking work and self-employed. Employed individuals are dominant internet users for social media (99%), learning new skills (35%) as well as buying (21%) and selling (24%) products or services. These usage figures are in stark contrast to those of school-leaving youths, of whom only 10% use the internet often to learn new skills, 18% to purchase products, 2% to sell products and 97% to connect on social media. Consequently, there are apparent asymmetries across the demographics in value derivation from the Digital Economy.

4.4.1. Risks and inhibitors to value addition

While the youths do notably derive value from the Digital Economy, even if more socially than productively, there are several hurdles that they identify which can impede their experience in the Digital Economy. These include:

Real and perceived security risks. The youths have identified security risks from digitalisation, largely stemming from false information. These risks include false advertising on social platforms, the fear of entering fake jobs and being lured into false investment schemes.

Fear of losing the human element in interactions. The youths have expressed concern that digitalisation could distance people, affecting family bonds:

“This is because when you enter a house, everyone has their phone in hand, creating a social distance”

– FGD participant (20–25), job seeker.

Unsustainability of jobs and social media businesses. Under lockdown, the demand for delivery jobs spiked. However, this demand is falling away as the economy reopens:

“Even the job of Delivery Boy is not working at the moment”

– male (25)

Social media business opportunities – selling goods on social media or working as a brand influencer – are also seen as unsustainable, especially as more people enter the online market:

“The disadvantages are that the work of digital platforms is limited and no one can make a long career on them.”

– male (16–18), job seeker

Capital may constrain youths’ ability to derive long-term value. Whereas digital opportunities exist across sectors, a lack of access to capital may limit youths’ digital entrepreneurship. Without financial support, they may be limited to small-scale activities to earn temporary income while seeking traditional employment.

Youth disenfranchisement. The research suggests that the youths do not feel as though they have options and strategies to acquire employment or a livelihood. They “*are stuck in survival mode*”, according to a youth employment stakeholder. This indicates that youths have not been an active participant or voice in the strategies aimed at developing the Digital Economy, or in leveraging the Digital Economy for education and employment. They do not feel that their voices are being heard:

“The problem here is that we don’t integrate young people, we use them. Adults have to make room for young people to develop.”

– female (17), just finished school.

Increased risk of excluding already marginalised youths. Globally, refugees and youth with disabilities remain less likely to extract value from the digital economy relative to other non-disabled youth and national citizens. This is because the benefits of digital innovation are not equally distributed, with the unconnected being disproportionately poorer, less educated, rural, female or persons with disabilities (GSMA, 2020). The mobile disability gap highlighted by research from the GSMA indicates that those with disabilities have not been enabled to participate in the digital economy (2020). Moreover, displaced populations who lack access to connectivity, digital devices and skills have become further isolated in times of social distancing due to COVID-19 (International Organization for Migration, 2020). Consequently, greater inclusivity is required for marginalised youth to derive value from digitalisation without broadening the disparity.

Interventions are needed for youths to reach their desired future state of work.

Despite the given inhibitors to value addition, the youths are optimistic about digitalisation and the future of work in the Digital Economy. As discussed, the youths broadly have access to the Digital Economy through their mobile devices, yet usage of specific economic tools, rather than just social media tools, remains limited. Consequently, they are failing to derive the full potential value that digital tools offer. This is largely due to limited training and restricted exposure to opportunities. In the focus groups, interviews and survey, the youths identified specific interventions needed for them to access greater value. These include digital skills training, youth mentorship, early exposure, and digital learning as part of the curriculum. Education is therefore identified as a key enabler of productive engagement with the Digital Economy, one helping the youths to arrive at their future desired state of work in the Digital Economy.

5. Education

The digital transformation of the Senegalese economy presents a host of new opportunities for individuals and businesses. However, without the human capital element Senegal cannot enjoy the full benefits of digital transformation. When human beings develop competencies in using digital technologies, they are better able to unlock the new opportunities presented by digital transformation. The education sector plays a key role in building foundational competencies such as reading, writing and conducting mathematical computations, and, in addition, more specialised competencies linked to vocations and specific digital skills competencies. It is important to understand the trends and challenges in the education sector when building both digital and non-digital skills competencies, as this strongly informs the readiness of Senegal (through human capital development) to unlock pathways for sustainable development made possible through digital transformation.

This section describes the context of the education sector, the challenges experienced, the opportunities for digitalising education, and the risks that need to be considered and mitigated when digitalising the Senegalese education sector. It concludes with a set of recommendations for Mastercard Foundation to consider when developing a strategy for intervention in the Senegalese education sector.

5.1. Sector synopsis

5.1.1. Context

Schooling compulsory for children ages six to 16. The Senegalese education system consists of four phases: pre-primary school (ages three to five), primary school (ages six to 12), lower secondary school (ages 13 to 16) and upper secondary school (ages 17 to 19). The National Education Law (Act 37 of 2004) makes schooling compulsory for all children of both sexes between the ages of six and 16. Compulsory education is provided free of charge in public educational institutions, and this promotes access to education. The National Education Law is, however, not enforced in areas where Islamic education is preferred (Mastercard Foundation Senegal, 2019).

Low enrolment, especially at secondary level. According to Global Partnership (2019), approximately 37% of school-age children in Senegal (six to 16 years) are not enrolled in the formal education system. Enrolment rates at a primary school level have remained above 80% for the past 10 years despite a recent decline from 87% in 2011 to 82% in 2019 (World Bank, 2019). The enrolment rates were markedly low at a lower secondary school (50%) level and at an upper secondary school level (32%). The high proportion of youths outside the school system is alarming as this is a direct contributor high youth unemployment rates in Senegal.

Low completion rates. Completion rates are also low. This signals challenges regarding the quality of education in Senegal. Globally, the average completion rate at a primary school level is 90%, whereas in SSA approximately 69% of the population have completed a primary school education (World Bank, 2019). Senegal, however, lags behind its African peers, with an average completion rate in primary school of 61%. There is also a rural–urban disparity in completion rates, with lower primary school completion rates in rural (38%) relative to urban areas (65%). Rates are improving, but at a slow pace. From 2005 to 2011 the completion rates for lower secondary school improved marginally from 10% to 15%. During the same period, primary school completion rates improved significantly from 25% to 40% but they remain low overall.

Language of instruction is recognised as an important determinant of school enrolment and literacy levels. The Constitution of 2001 dictates that the official language in Senegal is French, whereas the national languages are Diola, Malinké, Pular, Serere, Soninké and Wolof. There is no official education policy on the language of instruction, but, as the official language, French has become used predominantly in the formal education system. The value of integrating the national languages into the classroom has been recognised, though. As a result, several experiments have taken place since 2001 that have focused on introducing the six codified national languages into the Senegalese education system.³²

5.1.2. Policy

General policy context

Multiple ministries responsible for policymaking. There are three policymakers in the education sector, one for each of the three sub-sectors. The Ministry of National Education (MEN) is the policymaker for basic education and is responsible for pre-primary through to secondary school, and also adult basic education. Post-secondary school education falls within the purview of the Ministry of Higher Education, Research and Innovation (MESRI) and the Ministry of Vocational Training, Learning and Handicrafts (MFPAA). The former is responsible for public and private higher-education institutions, while the latter is in charge of Technical and Vocational Training (TVET). A joint sector review forum, which has existed since 2009, has been largely effective in ensuring alignment between the three ministries (Global Partnership, 2019).

Sector policy is focused on improving quality, equitable access to and effective governance of education. Since 2000, the policymakers have developed three policy documents, which cover the periods of 2000–2011, 2013–2025, and 2018–2030 (Global Partnership, 2019). The latest one, also known as the Programme for the Improvement of Quality, Equity and Transparency in Education and Training (PAQUET), has three objectives (Republic of Senegal, 2018):

- Improving the quality of education and training in all of their dimensions.

³² For example, to attempt to increase grade 2 literacy levels to 70%, USAID has a five-year programme called *Lecture Pour Tous* (Reading for All) spanning 2016 to 2021, which is supported by the MEN (USAID, 2020). The programme introduces the use of mother-tongue instruction (in Wolof, Pulaar & Seereer) in the classroom, highlighting the benefit of involving families and communities in their children's education through engaging with the more familiar national language of the learners.

- Strengthening the coverage, diversification and equity of the provision of education and training at all levels.
- Promoting integrated, inclusive, partnership-driven, decentralised, transparent and effective sectoral governance.

Broader economic policy prioritises better education outcomes to unlock economic development. The long-term vision for Senegal, as embedded in the *Plan Emergent Senegal* (PSE), is to transform the nation into an emerging country by 2035 (Republic of Senegal, 2012). The PSE has three main pillars, namely:

1. the structural transformation, and growth of the economy
2. human capital, social protection, and sustainable development
3. governance, institutions, peace, and security

The education sector has a key role to play in the human capital component. Policymakers acknowledged that in order to meet this objective, it was vital for the PSE and the PAQUET to be aligned. Therefore, shortly after the launch of the PSE, policymakers decided to replace the PAQUET (2012–2025) with a revised framework, the PAQUET (2018–2030), which demonstrated a high-level commitment to supporting the achievement of PSE.

Public–private donor partnerships have shown some success. Private-sector involvement in education is embedded in both the PSE and the PAQUET. In fact, the PAQUET welcomes the “development of partnership with the private sector for the purpose of structuring the supply of technical and vocational training, improving the employability of youths, and increasing interest in education and training in the response to the need for skilled human resources” (Republic of Senegal, 2018). The World Bank, in particular, has been involved in numerous projects aimed at youth training, as outlined in the box below.

Box 4. Overview of World Bank education initiatives

World Bank Skills for Jobs and Competitiveness project

Background:

In 2014, the World Bank launched its *Skills for Jobs and Competitiveness* project, an initiative between them and the Government. The project aims to improve the TVET system by delivering better-quality and more relevant training to improve the employability of youths in priority sectors such as tourism and agriculture.

Impact:

5,257 youths have been trained through the project thus far (World Bank, 2021).

Gaps:

- not focusing on digital skills (which are required by youths if they are to partake in the Digital Economy); and
- not meeting gender targets, suggesting that gender exclusion is systemic in nature and highlighting a need for continued efforts by projects to help to reduce gender-related gaps in accessing employment opportunities.

The Fund for Vocational and Technical Training (3FPT)

Background:

In 2014, the World Bank and the French Development Agency partnered with the Government to launch the Fund for Vocational and Technical Training (3FPT). Created by decree number 1264 of 2014, 3FPT is a private–public-sector collaboration that supports the training of professionals, organisations and individuals seeking technical and vocational training.

The 3FPT aims to prepare youths better to integrate them into the workplace through providing practical training. More recently, the 3FPT has noticed an increase in the demand for ICT-related training (Stakeholder consultations, 2021). Fibre optic installations have been one of the high-demand employment prospects that 3FPT has responded to.

Impact:

The 3FPT is a key contributor to the training of youths in digital skills. Overall, they have reached a considerable scale, with 50,657 beneficiaries who were supported between 2016 and 2018 (3FPT, 2018).

Gaps: The major gaps include:

- 3FPT is limited in its decree to training and therefore cannot play a significant role in integrating graduates into the workplace. The 3FPT does, however, encourage trainers to match learners to realisable work opportunities (Stakeholder consultations, 2021), though this is not guaranteed.
- Hosting facilities that are well equipped with the required infrastructure are in short supply (Stakeholder consultations, 2021). 3FPT is therefore limited in its ability to scale due a lack of hosting facilities.

Lack of common reporting frameworks between the PSE and the PAQUET hampers education policy outcomes. There are substantial differences in the reporting requirements of the PSE and the PAQUET (Global Partnership, 2019). It may therefore be challenging for donors to gain a holistic understanding of the key areas requiring support, as the PSE and the PAQUET do not set the same benchmarks nor do they track the same results in the sector. The MEN prepares an annual National Educational Sector Report (RNSE) that is used to track the progress of specific indicators and targets linked to the education sector. However, the indicators in the RNSE are not aligned with the indicators and targets in the PAQUET. Moreover, the education system suffers from data gaps that may reduce the benefit and value derived from education-sector reporting.³³

Policy in digital education

COVID-19 highlights need for digital learning. On 16 March 2020, the Government of Senegal took a decision to close schools due to COVID-19. This led to the closure of primary and secondary schools. Except for examination classes, which reopened in June, most of the schools remained closed until 12 November 2020 (Africanews, 2020). For a Senegalese education system battling to ensure that students remain in school, the COVID-19 pandemic derailed progress significantly, and showed up a lack of

³³ The MESRI report contains numerous data gaps where information could not be collected from educational institutions.

infrastructure to support the continuance of remote learning and assessments. A prevailing issue is that courses are currently taught in a traditional manner, with little to no incorporation of digital skills components into the teaching of non-digital subjects (Stakeholder consultations, 2021). This highlights the need to develop digital skills and ICT infrastructure to build remote capabilities for learning that would add resilience to the current education system.

Education-sector policy prioritises ICT to improve educational outcomes.

Digitalisation can play a significant role in democratising access to education, enhancing the effectiveness of governance and encouraging newer and more effective ways of teaching and learning, in the process raising the quality of education. The PAQUET recognises this, emphasising that a key opportunity exists in “developing the digital learning potential” (Republic of Senegal, 2018). Leveraging ICT can catalyse the effectiveness of ongoing activities that are focused on meeting the education sector’s strategic objectives. ICT is also at the core of ensuring the alignment of the PAQUET with the education-sector goals of the PSE. The PAQUET defines the following objectives for ICT (Republic of Senegal, 2012):

- to strengthen the use of ICT in teaching
- to establish the Virtual University of Senegal with open digital spaces
- to develop the “City of Knowledge”, which is a network of higher education; research, business, and training institutes across different regions in Senegal
- to set high-value research outcomes and promote access to technology by focusing on strategic areas for agricultural productivity, agri-food processing and ICT

Funding gaps in meeting the need for ICT in education. The Government of Senegal spends 7.5% of GDP on education annually. The SSA average for government expenditure on education is 4.1%, whereas the West African average is 4% (UNESCO, 2018). ICT is a key sub-component of expenditure in education. Nevertheless, funding is not sufficient to cover all needs. It is reported that the “one computer, one student” programme³⁴ has yet to meet its targets: in 2019, the student population was 195,207, yet only 24,097 computers have been distributed in Senegal since 2013 (Ministry of Higher Education, Research and Innovation, 2019).

5.1.3. Infrastructure

Limited access to electricity a key barrier, particularly in rural areas. The national average percentage of public schools in Senegal with electricity is 34.1% (World Bank, 2020). This is a significant barrier to adopting ICT-driven learning in a face-to-face classroom setting.

Smartphone access constrains digital education delivery. The high mobile phone penetration, as outlined in Section 3, can facilitate digital or remote learning, but the limited 3G–5G broadband-connected devices (51%) and low smartphone penetration (34% of adults) are obstacles to inclusive education through digitalisation. Without widespread smartphone penetration, youths are unable to access educational content and engage with the content meaningfully on their feature phones. Mobile phones are

34 Note that this programme excludes the Virtual University of Senegal.

therefore a helpful medium for youths to receive communications related to education and employment opportunities, but deeper engagement is restricted to the few who own smartphones.

Internet connectivity not widespread. The accessibility of online educational material is constrained by the accessibility of the internet, particularly in remote areas (Stakeholder consultations, 2021). Internet penetration in Senegal stood at 46% in January 2021, which represents 7.81 million internet users (DataReportal , 2021). Senegal's internet penetration rate is higher than that of regional neighbours Benin (29%), Togo (24%) and Côte d'Ivoire (47%) (Data Portal, 2021): 57% of youths in Senegal are estimated to have access to the internet (ILO, 2020).

Accessing educational content and employment opportunities constrained by mobile data costs. Even youths with smartphones and access to the internet by network connectivity may not be able to afford mobile data costs. It is estimated that data costs represent approximately 5% of the average Senegalese's income. Although in Senegal they are among the lowest in the WAEMU region, data costs are relatively high compared to those in other regions in SSA (Research ICT Africa, 2020). Moreover, constrained household budgets limit accessibility to data regardless of absolute cost.

5.1.4. Challenges

High pupil–teacher ratios. The Senegalese schooling system is short-staffed, with a pupil–teacher ratio of 30 at pre-primary level, 36 at primary level, 28 at lower secondary, 19 at upper secondary and 28 at tertiary level (World Bank, 2018).

Poor, but improving, teacher qualifications. There is a significant gap in teacher training in Senegal. Only around 60% of teachers have a high school diploma or a higher qualification. Previously there was no formal requirement for teachers to have obtained a certain minimum qualification. As part of the PAQUET, though, the requirements were formalised. By 2018, approximately 79% of Senegalese primary school teachers had received at least the minimum organised teacher training, up from 46% in 2008 (United Nations, 2019).

Poor-quality educational outcomes. Limited teacher numbers and sub-optimal teacher training contribute to poor-quality outcomes. The low proportion of children and young people who are achieving a minimum proficiency level in reading (29%) and mathematics (35%) at primary school level suggests that there is a serious problem with the quality of education in Senegal (United Nations, 2019). Literacy rates among youths between the ages of 15 and 24 were estimated to be 69% in 2017 in Senegal, compared to an SSA average of 76%. There are also stark differences in Senegal: for example, 78% of adults in Dakar are literate relative to only 24% of adults in Kaffrine (Dalberg, 2021).

Gender disparities. Gender considerations are important in understanding the opportunities available to females relative to males in the Senegalese context. Females comprise approximately 60% of the illiterate population. In addition, more males complete secondary school than females, despite more females being enrolled in both primary and secondary school. In 2017, only 10% of females in Senegal completed their upper secondary education relative to 15% of males (United Nations, 2019). This suggests that

females have far fewer opportunities for furthering their education and ultimately obtaining access to meaningful and fulfilling employment opportunities.

Pupils with disabilities less likely to attend school. While children with disabilities have the right to the same quality of education as their peers by law, 66% of disabled pupils are not in school, compared with 37% for Senegal as a whole (Handicap International, 2020). Several reasons are cited in literature, namely that teachers lack the skills to meet disabled students' educational needs and struggle to teach them adequately, parents underestimate their children's abilities and keep them out of school, and public policies do not yet sufficiently target inclusive access to education (Handicap International, 2020).

Lack of access to content. One of the significant barriers to quality education is the lack of access to academic content. There are approximately 0.68 textbooks per learner at a primary school level, which indicates that 32% of learners do not own textbooks (Global Partnership, 2019). This is a significant barrier that ties in strongly to the quality of education and therefore can be seen in the poor completion rates. The adaptability of physical textbooks to improved academic content is also limited as it carries the high costs of reprinting and distributing them to schools across the country. Digitalising academic content may help to improve the accessibility of learning material and increase the adaptability of academic content to changing educational needs.

Limited study of STEM fields. Not enough students pursue tertiary studies. Roughly 75,000 students matriculate every year, with only 15% enrolling at tertiary institutions (Stakeholder consultations, 2021). Of those who do enrol, less than 17% of students pursue studies in STEM (science, technology, engineering, mathematics) fields; only 2% of students pursue technical fields in their first year of university in comparison to over 81% of students pursuing humanities (Ministry of Higher Education, Research and Innovation, 2019).³⁵ UVS allows students who matriculated with literature courses to still access valuable courses linked to the Digital Economy – for example, mobile web development. This is, however, not necessarily the case at all institutions as the focus of most universities is on humanities, with few specialisations in STEM and digital skills (Stakeholder consultations, 2021).

Limited practical or entrepreneurship training. Even for those who do study STEM subjects, schooling remains highly theoretical in nature. While a lack of infrastructure or hardware access is certainly a driver of this phenomenon, there is also a significant “teaching style” bias against applied learning. The teaching of entrepreneurial skills is also limited³⁶ and few linkages exist between the education sector and those industries that are likely to absorb youth labour. A lack of business training was highlighted by youths and school-leavers as a significant challenge to entrepreneurship (Youth Insights, 2021). This creates a mismatch between the profile of the youth labour force and the needs of the job market.

35 MESRI reports that the university acceptance rate from STEM and technical fields is 47% compared to the literature fields, which is around 35% (Ministry of Higher Education, Research and Innovation, 2019). This indicates that there are many high school graduates who will not be able to access higher education as the humanities courses remain oversubscribed.

36 See Annexure 3 for an overview of the initiatives targeting youth entrepreneurship.

Nascent digital vocational training platform. The TVET system focuses on a more pragmatic type of training that enables a more seamless integration of students into the labour market. TVET training courses can, however, be expensive to develop as they require highly specialised equipment and machinery³⁷ (Stakeholder consultations, 2021). In response, the Ministry of Employment, Vocational training, Learning and Integration has set up the e-Jang online learning platform.³⁸ Since its launch in 2020, the platform has uploaded 1,408 courses, has 3,881 activities, and 1,395 users.

Challenges to digital learning

Limited use of digital technology for learning. In general, the use of digital technologies remains limited. While coding schools such as Mjangale and universities such as Virtual University of Senegal (UVS) have begun leveraging digital technologies for education, this is the exception rather than the rule. Youths do not consider digital awareness and literacy to be a critical success skill (Youth Insights, 2021).

Limited trust in digital channels. Digital learning also faces demand-side barriers. A culture of distance learning has not yet been established. Among other things, this is witnessed in a high dropout rate of between 40% and 50% of students of the UVS at first-year level (Stakeholder consultations, 2021). Even COVID-19 does not seem to have changed norms: there is a shared sentiment that once it is no longer necessary to enforce social distancing, learning should revert to pre-COVID-19 practices (Stakeholder consultations, 2021).

Teachers' limited digital skills. Stakeholder engagements highlight that there is also a gap in the ICT skills set of teachers (Stakeholder consultations, 2021). Further teacher training is required to ensure the smooth and wide integration of digital skills into the basic education system (Stakeholder consultations, 2021).

5.2. Role of digitalisation

The infrastructural deficiencies and challenges outlined above suggest a definite role for digitalisation in driving efficiency gains and improving educational outcomes in Senegal. However, the digitalisation of learning also faces a number of challenges. Below, we identify opportunities for overcoming the challenges and furthering the role of digital innovation in education and discuss the corresponding risks to mitigate, as a basis for concluding with recommendations for the potential role of MCF Senegal in leveraging the role of digital technology for better educational outcomes for youths.

5.2.1. Opportunities

Leveraging policy stance on public-private partnerships. The Government's willingness to join forces with development partners – as witnessed, among other things, in the PAQUET's emphasis on the PPP model – presents a key opportunity to approach sector challenges from multiple angles. There is considerable involvement

37 The hosting capacity of 3FPT, for instance, is limited due to its training being offline.

38 The four main types of training covered include professional, vocational, apprenticeships and the training of trainers. The platform facilitates training and examination to acquire technician certificates, superior technician certificates and completion certificates from the *Centre de Formation Professionnelle et Technique* (CFPT).

from development partners already, with the World Bank, Mastercard Foundation, UNESCO and the French Development Agency being the main players. However, there is further scope to build on completed projects or to scale existing projects through a coordinated effort.

Overcoming barriers to online learning. The main barriers to the adoption of digital learning relate to infrastructure and the lack of familiarity with this method of learning. There is a need to build trust in and acceptance of the online/blended model of learning among students, parents and educators. One specific opportunity is the e-Jang platform that was launched recently. Familiarity with this platform should be enhanced and the challenges that users face in accessing it should be understood. Such learning can then be leveraged to scale online learning. Familiarity with digital content has to be built on in unison with removing infrastructure-related barriers to digital learning through providing devices and internet access to students (based on needs). A key opportunity for development partners lies in overcoming these two interconnected barriers.

Using digital technologies in a blended learning environment to reach marginalised groups. A successful online learning model is often accompanied by in-person teaching for practical learning (Stakeholder consultations, 2021). Adopting digital technologies in a blended learning environment presents opportunities to remove the gender barrier for women who have family responsibilities that limit their mobility to physical education institutions. It also presents an opportunity to increase rural participation through removing the geographical barrier for rural students. There is, however, a need to follow the UVS model and distribute digital devices to needy students and provide them with connectivity to ensure they can actively engage in blended learning. More specifically, a clear opportunity exists to replicate the open digital spaces provided by the UVS in an educational institute-agnostic fashion.

Overcoming educators' limited proficiency and understanding of digital skills. Policymakers have begun prioritising capacity-building for teachers. Existing initiatives include the work done by UNESCO (see Box 4 below) and the World Bank in training teachers and also the work done by the Mastercard Foundation with lower secondary school teachers in the APTE programme. Many of these initiatives, however, do not focus on digital skills training as their core value addition. There is therefore a need to coordinate with existing initiatives to incorporate digital skills into the training packages. The existing initiatives that do include some digital skills training, such as the 3FPT-funded training courses, still require the trainers to be upskilled to ensure that the quality of the training is up to standard (Stakeholder consultations, 2021).

Box 5. UNESCO role in training teachers in digital skills

The CapED Covid-19 project

- **Background:** The CapED Covid-19 project involved training in the production and administration of distance courses with the use of radio, television and digital technology (Stakeholder consultations, 2021).
- **Impact:** 207 trainers of trainers were trained in techno-pedagogy in August 2020. Based on a contract of objectives between the MEN and the trainees, each trainer should train 100 teachers, which would make it 20,000 teachers trained to date (7 trainers were volunteers and not signatories to the contract) (Stakeholder consultations, 2021).

The ImaginEcole project (Regional distance education platform for 10 French-speaking African countries, including Senegal)

- **Background:** The ImaginEcole project consists of training modules from the Canopy Network (UNESCO's Main Partner in this project) that focus on digital skills for teachers aligned with UNESCO's ICT skills framework. Advanced training modules are also planned as part of a UNESCO/IFEF collaboration (Stakeholder consultations, 2021).
- **Impact:** The training of trainers was due to start from 17 May 2021 and 1,000 teachers are targeted by the end of October 2021 for Senegal (Stakeholder consultations, 2021).

The project "Ensuring continuity of learning for the most vulnerable children and adolescents in Senegal" UN Covid-19/MPTF39 (United Nations Special Fund for Response to Covid-19)

- **Background:** The MPTF project trainings were presented both face-to-face and remotely with the use of the digital platform. They focused on the design and delivery of courses via online learning platforms, including a focus on (i) publishing online courses, (ii) administering online courses, (iii) standards for developing radio and television educational content, and (iv) the student's continuous and final assessment in the context of distance learning (Stakeholder consultations, 2021).
- **Impact:** To date, 114 teachers have been trained in techno-pedagogies: 100 from TVET education and 11 from general education. It is currently planned that in May 2021, 86 general education teachers will be trained, bringing the total number to 200 teachers trained in techno-pedagogy as part of this project (Stakeholder consultations, 2021).

Korea Fund In Trust (KFIT) 2 – Senegal – "Transforming education in Africa through ICT"

- **Background:** The planned training will enable beneficiaries to acquire digital skills, including skills related to (i) developing and mobilising technological skills, (ii) collaboration through using digital technologies and (iii) disseminating information using ICT (Stakeholder consultations, 2021).
- **Impact:** The KFIT 2 project has yet to train any teachers; however, it is expected that 4,800 teachers and staff from the structures of the Ministry of National Education will be trained in the use of digital platforms already developed by the Ministry (through the National Education Information and Management System (SIMEN) (Stakeholder consultations, 2021).

Working with teachers to deliver STEM content in a new way. From a broader public-school perspective, it is initially essential not to isolate the subject of digital skills or necessarily introduce new content, but rather to deliver the existing curriculum in a new way by means of digital teaching mechanisms. For instance, the current theoretical nature of STEM could be resolved through introducing more practical components that involve digital technologies, hackathons and competitions. This approach could also be applied to other subjects where teachers could integrate digital technologies in their classrooms, which is a way of also introducing learners to digital technology. This type of support should include Modern Daaras and ensure that they receive full infrastructure support and training in making use of digital teaching mechanisms.

Improving the adaptability of the education system through digitising educational content. A lack of access to up-to-date textbooks contributes to the quality challenges in the education system. Digitising content has the scope to overcome textbook development and distribution challenges, and so promoting inclusive learning. In addition, specialised courses that incorporate digital skills into different subject-matter are more easily developed through digital content that promotes interactive learning.

5.2.2. Risks

Focusing only on digitalisation. One of the key pitfalls with over-relying on digital transformation to solve several long-standing challenges is that it diverts attention from challenges that do not require digital interventions. For instance, soft skills related to creating CVs and business plans play a significant role in ensuring that youths can access income-generating opportunities. Without also focusing on soft skills, Senegalese youths will lack the professionalism required to be high-quality recruits or business-savvy entrepreneurs. Similarly, any digitalisation strategy is dependent on ICT infrastructure and hardware or device access. Partnerships across initiatives can help to integrate digital and soft skill development,⁴⁰ as well as infrastructure and device access, to ensure the completeness of interventions. A narrow focus on digitalisation without ensuring that the infrastructure and hardware are in place to support digital learning will be set up to fail.

Rolling out digital interventions that are not user centric. When digital interventions are not user centric, it is inevitable that there will be challenges in ensuring uptake and continued usage. For instance, the expected positive benefits of digitalising textbook content may be that it solves long-standing textbook shortage challenges. However, even if the correct infrastructure is provided, this intervention still requires that the actual educational content is of a high quality, interactive and developed with the end-user in mind. Without this, users may revert to non-digital methods. To ensure that digital transformation interventions are grounded in user realities, there should be a consultation process that involves both teachers and students as ultimate end-users.

Losing quality through digitalisation. Stakeholder consultations indicate that the movement towards adopting digital technologies in education is a long journey that requires carefully planned steps. Key lessons from existing models in Senegal suggest that a digital-only approach is not effective in ensuring students' progress and the completion of their studies. Some of the enriching discussions (teacher to teacher and student to student) that add to the quality of education are experienced in in-person

40 For instance, ANPEJ plays a critical role in helping youths to compile CVs and business plans.

classes. A hybrid (blended learning) approach that applies a combination of online and face-to-face techniques and which focuses on practical skills alongside theory would combine the benefits of digital and in-person learning.

Digitalisation of education can increase the digital divide if it is not implemented in a coordinated manner. There is a key risk with developing new initiatives in silos, in that the initiative may create further inequality. This could be exacerbated by the urban vs. rural differences in access to devices, network quality and electricity. Not only urban versus rural disparities are a concern, but also access barriers faced by marginalised youth, such as pupils with disabilities as well as refugees. This risk can be mitigated by being aware of the existing inequalities in accessing electricity and digital technologies, geographic and beyond, and engaging with ongoing initiatives by the public and the private sectors as well as donors to reduce infrastructure-based inequalities. Another mitigation strategy would be to partner with laptop providers as well as MNOs who can zero-rate educational content so as to promote access to digital educational content for marginalised students. It is also important to keep accessibility of digital devices in mind, especially for those with disabilities. Seeing the screen, pressing buttons and navigating a digital device can be challenging and requires accessibility assistance that is centred around needs.

There may still be components of the educational processes that are slow to digitise. The administrative processes of educational institutions are the gateway for students to access educational opportunities. Only focusing on digitising in-classroom activities and neglecting the administrative processes creates the risk that innovative delivery is undermined by poor or analogue administrative processes. This risk can be mitigated through a holistic plan to digitise registration and application processes alongside education content and delivery.

Digital transformation can be disruptive if the pace is too rapid. Digital disruptions are often seen as necessary innovations that displace traditional, out-dated methods of doing things. However, in the educational context, curriculum changes often occur at a planned pace to limit disruptions to the educational progress of learners. Digital disruptions that happen too quickly can undermine progress for learners who are unable to adapt quickly enough. The digitalisation of Senegal's education system needs to be fit for purpose for the Senegalese context. Any digitalisation strategy should be phased in through piloting to test the pace required to integrate fully an intervention on a national scale.

5.2.3. Recommendations

The discussion above highlighted a number of opportunities for stakeholders from the public, private and donor spheres that are seeking to promote the digitalisation of education to empower youths to access dignified and fulfilling work. It also highlighted the risks to be avoided. What, out of this suite of potential interventions, should MCF focus on? Below, we highlight four potential areas where MCF could add value: through funding, brokering relationships, convening, and training.

Funding role

To develop more practical skills and develop familiarity with ICT, MCF could play a role in supporting access to ICT for education. MCF could identify and distribute devices such as smartphones, tablets, laptops, or desktops to qualifying students and teachers, including disabled students and refugees, as well as other marginalised youth. MCF could also pay for the costs of connecting those devices to the internet. By equipping development training centres, MCF can help ensure that the learning that takes place at these training centres is not only theoretical but practical too. One particular opportunity lies with the 3FPT initiative, which is currently aiming to fund the training of 24,000 young people in a private sector-led project. Thus far they have trained 3,000 youths, but they are facing hosting constraints that have slowed down progress. Therefore, the initiative would benefit from support specifically to increase their capacity to host training sessions.

To expose youths to STEM, MCF could play a role in funding hackathons and other STEM-related competitions. MCF could introduce students to the possibilities that a career in STEM could offer. Coding schools like Mjangale have the capacity to train and mentor learners but they could benefit from the funding support that is needed to host large hackathons and other STEM-related competitions. This ensures that the learning and mentoring component is part of the process of building the next generation of developers and scientists. The current landscape does not have substantial support on this element, so it may be a key opportunity for MCF also to begin working closely with the Ministries, particularly on training teachers to enhance STEM learning, but also to encourage more youths and women to study STEM subjects.

Leverage the youths to democratise digital skills. Youths have a key advantage over the older generation in that they are more digitally savvy. A key opportunity exists to train and recruit youths as digital ambassadors who could train and mentor the general population on basic digital skills. The mentorship component is vital to leveraging the human element in bridging the digital skills and virtual learning gap. The process could include training digital ambassadors and leveraging digital open spaces in which to conduct training sessions.

Digitising library books and textbooks. MCF could fund the digitising of library books and textbooks as a means of building inclusive education. This is also particularly relevant for the significant number of visually impaired students. The current public education system is unable to meet the demand for textbooks among learners, which affects the educational outcomes in the sector. The digitisation of content could help to save the costs involved in printing and distribution, but it requires access to hardware and data. Working with the Government and implementing content digitisation along with the provision of digital devices is important to ensuring initial uptake and continued usage.

Relationship brokering role

Increase the uptake of digital learning platforms through integrating these platforms with face-to-face initiatives. The currently underutilised e-Jang platform could benefit from being connected to other formalised face-to-face training. Face-to-face training, in turn, could save on printing costs and the costs incurred in developing new content by leveraging courses already uploaded on the e-Jang platforms. Rather than

developing a new digital learning platform for 3FPT, MCF could support the merging of the world of offline TVET learning happening at 3FPT with the online content on e-Jang.

Negotiating the zero-rating of education content. MCF could negotiate with an MNO to zero-rate certain educational content such as learning platforms. Tigo has already partnered with Facebook in 2015 to zero-rate “internet.org” in Senegal (providing AccuWeather, BabyCenter & MAMA, BBC News, UNICEF, Facebook and UNICED Facts for Life). It may therefore be a good partner to approach. UNICEF is another potentially valuable partner in this effort.

Convening role

Hosting career fairs. MCF could play a convening role in bringing together the private sector and academic institutions by hosting career fairs. Senegal’s Training and First Employment Fair in Dakar is a large fair that managed to attract 4,000 people in 2017 (Lycée Jean Mermoz, 2018). There is a need to extend access to such career fairs to different regions. Digitalising the fairs is one key intervention. Leveraging different spaces around Senegal could also serve to expose youths to a variety of career-path options and inform them of the specific skills necessary to obtain employment. Content from such a fair could be turned into a repository of digital content over time. OPTIC and its members could be good partners to run industry surveys on private-sector needs to develop better train-to-work programmes.

Training role

Training teachers. UNESCO’s ongoing teacher training initiative (as outlined in Box 5) could possibly scale if it receives support from MCF. Currently, only a small proportion of teachers have received digital-related training, so scaling this is an essential part of a hybrid learning model. The hybrid approach is supported by the Ministries, who see great value in combining traditional pedagogies with digital learning platforms. Another training opportunity that MCF could consider is with the 3FPT, which leverages different institutes to teach students both non-digital and digital skills. The trainers at these institutes could themselves benefit from training to enhance the overall quality of training courses to students. The difference between this and the UNESCO opportunity is that the 3FPT opportunity would position MCF as a big influencer in TVET training that are closer to the labour market, as compared to the more general education system, which would be influenced more through the UNESCO opportunity.

In order to increase the value that school leavers derive from the digital economy, it will be important to increase the value they derive from digital learning during their education years. Currently, the youth reports to not derive much value from the digital economy. One reason for this is that digital tools are mostly associated with social media and social platforms rather than as a means to engage in the digital economy in a more substantial way. If digital tools can be adequately leveraged in learning from a younger age, the link to their usefulness for a professional life after school can be made more easily. This underscores the importance of utilising digital tools and instruments, both for basic education but also for the sector-specific TVET courses and targeted training initiatives.

6. Agriculture: Groundnuts

Digitalisation offers the agriculture sector a range of compelling opportunities for making gains in productivity and employment. In particular, the peanut value chain in Senegal is identified as an area where digitalisation can enhance efficiency and generate youth employment. As one of the leading employers and producers in the agriculture sector, the peanut value chain has the potential to generate far-reaching impacts on livelihoods and on the economy more broadly. Key challenges in the value chain include bottlenecks, poor logistics and coordination, asymmetric information flows, and limited access to inputs. Digitalising the value chain can help to overcome these challenges through enhanced coordination, throughput, and access to markets. In addition, digital innovation in agricultural practices, using Precision Agriculture techniques, can serve to increase sector productivity further.

This section begins with an economic overview of the peanut value chain, followed by an analysis of the key challenges faced by the sector. After that, opportunities for digitalisation to respond to these challenges and enhance productivity will be explored, and the possible risks of digitalisation will also be considered. Finally, practical recommendations for MCF and sector players will be presented with a view to realising digital opportunities in the value chain.

6.1. Sector Synopsis

6.1.1. Economic Context

The peanut value chain is a key contributor to Senegal's agriculture sector. Peanuts have historically been an important product for Senegal, the country producing almost a quarter of all global peanut exports in the 1960s (Stephen Golub, 2019). Peanuts remain a key contributor to Senegal's agriculture GDP, accounting for approximately 60% of agriculture GDP (World Bank, 2018). Although Senegal's export share has declined in recent years, the World Bank maintains that Senegal exhibits a "strong comparative advantage" in groundnut production (World Bank, 2017).

Liberalisation has led to significant growth in demand for groundnuts. In 2010, the Government lifted a ban on whole nut exports, leading to a boom in demand for Senegalese peanuts – particularly from China (Gro-Intelligence, 2015). Groundnuts, both shelled and in-shell, displayed annual growth rates in export value of 151% and 269% respectively in 2019 (International Trade Centre, 2019). Production has subsequently grown to meet international demand: 1,050,000 tonnes of groundnuts in shell were produced in 2015 and 1,421,288 tonnes were produced in 2019 (Food and Agriculture Organisation of the United Nations, 2019). This indicates that the revenue from groundnut production has seen a significant increase.

Liberalisation has led to negative consequences for downstream activities. Local processors have battled to compete with international players as a result of price competition. International players are willing and able to pay higher prices for Senegalese groundnuts (Stakeholder consultations, 2021). Consequently, the sale of peanuts to local processors has declined, leading to insufficient peanut supply for their activities: for example, groundnut oil production experienced a reduction from 220,000 tonnes in 2011 to 112,000 tonnes in 2012 (Food and Agriculture Organisation of the United Nations, 2019). Despite the downturn experienced as a result of liberalisation, there has been a recent uptick in demand, with oil production reaching 125,000 tonnes in 2018. Downstream activities have the potential to harness further growth if the diversification of processed goods, in areas such as edible peanuts and oil cakes, is prioritised (Georges, et al., 2016).

The value chain is a significant contributor to livelihoods. Peanuts are estimated to have created 1 million indirect and direct jobs in 2015 (Gro-Intelligence, 2015). In 2017, 482,000 farmers were employed in groundnut production – equivalent to 63% of Senegal’s farming population (World Bank, 2018). The sector is a particularly notable employer of women, who primarily engage in the processing and selling of peanuts (World Bank, 2011). The value chain is well positioned to employ youths since youths make up more than 60% of the population in the groundnut basin – situated above The Gambia (OECD, 2018).

Downstream activities present key opportunities for women. The processing stage of the value chain has the potential to be a large employer of women, as women were estimated to be involved in 80% of all processing activities in Senegal in 2011 (World Bank, 2011). Numerous opportunities in peanut processing exist,⁴¹ yet peanut oil remains the primary product (Georges, et al., 2016). There is therefore the potential for growth and employment in the sector if the diverse opportunities in processing are harnessed. Women in the value chain have identified some of these opportunities:

“Currently, we have the possibility of transforming peanuts into oil which we manage to sell at the same time as the residues of the product which are used to feed the cattle ... nothing is useless in this peanut value chain”

- FGD participant (21-35), female peanut producer

Policy goals in place to restore and expand the peanut sector. Growing the sector is prioritised in the PSE under the following goals:

- Raise peanut production and productivity by 50% by 2020 (Republic du Senegal, 2014).
- Greater diversification of processed goods, replacing 10–30% of groundnut oil production with edible nuts by 2023.
- Create a competitive oil industry, replacing 20–30% of imported oil consumption with locally produced groundnut oil.
- Raise the demand for Senegalese groundnuts – primarily from China and Vietnam.

41 Including food products (peanut butter, biscuits, cooking oil), household items (paint, varnish, fuel), agricultural inputs (insecticides, fertilisers, animal feed, nitroglycerine), beauty products (cosmetics, soap), building materials (plastics, wallboards, abrasives) and cellulose (rayon, paper) (Georges, et al., 2016).

Strong regulation and structured coordination characterise the value chain. As can be seen in Figure 12, the value chain is structured as follows: the input market supplies fertiliser and pre-base seed to farmers; the farmgate market then has farmers sell produce to processors and, more recently, to exporters; following the sale of whole peanuts to processors, peanuts are crushed into oil (the primary processed good) and mainly exported, with a small local market (World Bank, 2018). Intervention exists at all stages of the value chain. Post-harvest, the sale of peanuts to processors is regulated by means of a minimum price set by the National Interprofessional Groundnut Council (CNIA) – which functions as the value-chain manager with support from the Senegalese Government (MAER) (World Bank, 2018). While intervention aims to support farmers and millers, strict regulations at each stage of the value chain have given rise to market inefficiencies, hampering productivity and growth in the sector.

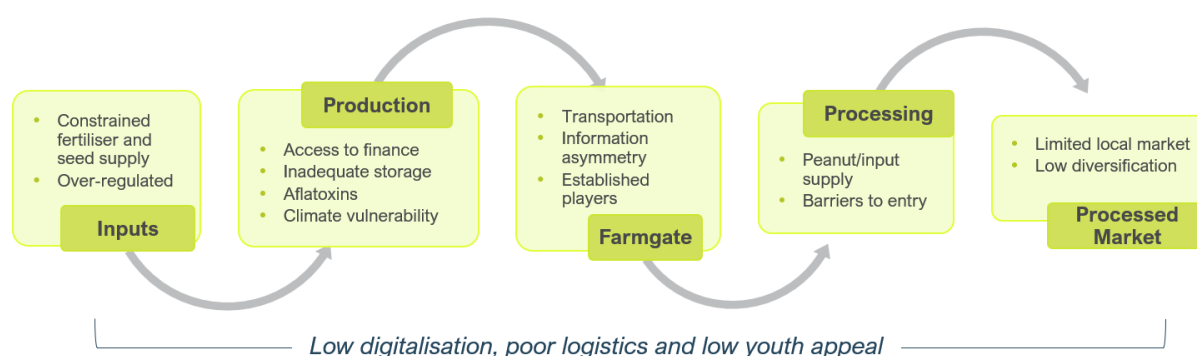


Figure 12. Value chain structure and key challenges

Source: Authors' own

6.1.2. Challenges

Cross-cutting

Bottlenecks and poor coordination inhibit efficiency. The peanut value chain faces bottlenecks and coordination failures at multiple stages. At the input stage, there is a constrained supply of pre-base seed and fertiliser, largely due to limited players in input production and distribution (World Bank, 2018). In production, farmers battle to access finance for the necessary capital to produce at scale. Post-harvest, inefficient transport and poor storage facilities contribute to spoilage and inhibit throughput to buyers, and processors battle to access sufficient peanut supply (Stakeholder consultations, 2021). These constraints hinder the value chain and mean that it is currently operating below its potential productive capacity.

Barriers to entry constrain growth in the value chain. The peanut value chain is well established and highly regulated, with several dominant players at the input and processing stages. Although such a structure has resulted in a relatively coordinated value chain, the notable involvement of government actors and the prevalence of large players has contributed to limited competition in the sub-sector, particularly in input and processing markets where the power dynamics between small and incumbent players

are most stark. These factors have been identified as a barrier to entry for new market participants (World Bank, 2017). In addition, the value chain is coordinated largely offline, inhibiting the visibility of gaps for entry. This means that prospective players will struggle to enter the market.

Lack of access to markets. Market access is limited for rural players throughout the agriculture sector in Senegal (Stakeholder consultations, 2021). This is particularly true for marginalised groups such as refugees, whose survival often relies on small-scale farming practices (Stone, 2005). Rural women involved in the peanut value chain tend to be limited to using processed products in their own households or selling them at local markets. This requires physically travelling to the market to sell goods and can be a significant limitation for people with physical disabilities seeking to participate in the value chain. Despite liberalisation, farmers typically sell by bringing their produce to collection points or an exporter’s warehouse, shaping their choice of buyer by the prevalence and physical location of these points (World Bank, 2018a). Focus group interviews revealed that barriers to market access remain pervasive among small players in the value chain, with one female peanut farmer reporting that being unable to sell her crops was a major difficulty (Youth Insights, 2021).

Lack of digitalisation throughout the value chain. There is an overarching lack of digitalisation throughout the value chain, providing little support for a digital start-up to leverage from and limiting the potential uptake of digital innovation in farming practices. Adequate digital infrastructure is not yet in place, even for larger players such as the CNIA, to seamlessly adopt digital tools or services (Stakeholder consultations, 2021). At the farmer level, basic infrastructure is absent, which may limit the adoption of advanced farming technology or even irrigation processes:

“Currently we only have manual watering cans. We fetch by hand and we walk to the plantations to water plants”

- FGD participant (21-35), female peanut producer

Information asymmetry between producers and FSPs hinders financing. Multiple stakeholder interviews emphasised that access to finance is one of the largest barriers to agriculture growth in Senegal (Stakeholder consultations, 2021). This was highlighted as a barrier faced by female peanut producers, as “the major difficulty for women remains the lack of resources and financial support” (Youth Insights, 2021). Yet, FSPs continue to perceive the agriculture sector, particularly young people in agriculture, as being high risk. This is largely since players often lack collateral and have no credit history. The UNCDF has identified that the lack of high-quality information as well as asymmetries between FSPs and clients in Senegal has driven up costs for both parties (United Nations Capital Development Fund (UNCDF), 2020).

At the farming stage

Undersupply of inputs. There is a limited supply of certified groundnut seed and fertiliser in the peanut value chain. The allocation and production of certified seed are controlled by the *Institut Sénégalais de Recherches Agricoles* (ISRA) (World Bank, 2018). The ISRA, however, cannot produce enough pre-base seed to satisfy the demand.

Bottlenecks in fertiliser provision stem from the fact that most of Senegal's fertiliser is imported and few companies are authorised to import and distribute fertiliser (P.A. Fuentes, 2012). Fertiliser access issues have raised domestic prices to roughly 51% over international prices, while the constrained supply of certified groundnut seed has seen farmers resort to planting whole groundnuts, which are not traceable and are of questionable quality, contributing to low yields (World Bank, 2018a).

Vulnerable to climate change. Peanut farming in Senegal relies mostly on rainfall for water and is vulnerable to climate variability. Droughts in the 2000s had a severe impact on production (Gro-Intelligence, 2015). Today, farmers in peanut-growing areas continue to struggle to access irrigation. In addition, farmers are unable to predict weather patterns, making it difficult to decide when to plant (Bernards, 2020). With little adoption of available technologies in irrigation and weather forecasting, the sector remains vulnerable to climate change.

Aflatoxin contamination undermines revenue in the value chain. Peanuts are affected by fungi that produce carcinogenic toxins, aflatoxins (Gro-Intelligence, 2015). The fungi typically occur before harvest and worsen, depending on storage (American Phytopathological Society, 2020). Farmers lacking access to appropriate threshing, drying and storage methods are particularly prone to contamination (Gro-Intelligence, 2015). Consequently, aflatoxins have reduced the international appeal for Senegalese peanuts. The EU, for example, will not accept certain peanut products from Senegal due to contamination, giving rise to an annual loss in export value of approximately USD281 million (Gro-Intelligence, 2015). Encouragingly, AflasafeSN01, an aflatoxin biocontrol product, has been registered and approved in Senegal for commercial use (Senghor, et al., 2021). The crucial next step is the distribution of Aflasafe across the country.

Labour-intensive farming practices and low returns. Young farmers are entering more niche, higher-value agricultural crops such as strawberries and tomatoes (Stakeholder consultations, 2021). They perceive peanut farming to be a traditional activity carried out by older generations – associated with hard work and little financial gain. Indeed, traditional peanut farming does involve intense manual labour, with one female farmer reflecting, “in our area, some women can acquire between 200 and 300 kilos of peanut seed that they carry with their husbands’ rickshaws” (Youth Insights, 2021). Yet, youths are failing to identify downstream opportunities as well as the opportunity for technology to transform traditional activities in the value chain.

At the transportation stage

Poor logistics and transportation. The peanut sector faces challenges in accessing efficient and reliable transport and logistics. Female producers in the sector currently rely largely on their own manual labour to transport goods, which may not always be easy or feasible depending on the distance to markets or the physical limitations of value chain participants. This was highlighted by interviews with women in the value chain:

“We do a hard work. Particularly transporting the raw material until it is transformed into peanut powder... a person with a motor disability would experience all the difficulties to achieve it.”

– FGD participant (21-35), female peanut producer

Logistics providers have battled to scale services across agriculture sectors, and particularly across the peanut sector, due to constrained access to capital and insufficient risk management (Stakeholder consultations, 2021). Scaling logistics services requires a significant capital outlay to have more transport providers as well as larger fleets and specialised vehicles. At the same time, scaling increases risk exposure and requires support through improved risk management. Barriers to the expansion of logistics services consequently limit the potential for efficiency gains across the peanut value chain as well as the agriculture sector more broadly.

At the processing stage

Large international players limit local peanut access. Liberalisation in the value chain has led to a constrained peanut supply for processors, placing severe strain on their operations. This is because international players, such as China, have a large demand for peanuts and offer higher prices to peanut sellers than local processors. As a result, most peanuts produced in Senegal are exported and oil mills are forced to operate at reduced capacity. According to a recent World Bank study, Senegal's largest oil millers struggled to reach even half of their potential capacity between 2015 and 2016 (World Bank, 2018). Société nationale de commercialisation des oléagineux du Sénégal (SONACOS), the largest player in peanut processing, went bankrupt following the decline in processing and became re-nationalised in 2016 (World Bank, 2017).

Small local market for processed goods. The local market for processed peanut products in Senegal is small. Most peanut oil produced by industrial mills is exported, while artisanal processors sell peanut oil, butters and oil cakes on a small scale (Stakeholder consultations, 2021). This is probably because peanut oil, sold formally, is expensive for consumers – who resort to other vegetable oils for cooking (World Bank, 2018). For this reason, the small market for processed products has contributed to the opportunity for diversification remaining untapped.

6.2. Role of digitalisation

Digitalisation can play a powerful role in unlocking barriers in the value chain. Digitalisation can unlock barriers to job creation and foster efficiency in the value chain, but its potential has yet to be fully explored. There are several avenues through which digitalisation can be leveraged to enhance the sector and promote youth employment: using digital tools to enhance logistics services, digitalising the central coordinating body for more effective coordination, a digital marketplace to increase access to inputs and information in addition to using Precision Agriculture practices to create efficiencies and productivity in peanut growing.

6.2.1. Opportunities

Enhancing logistics through digitalisation

Growing logistics is an opportunity to improve productivity, efficiency and coordination. Some of the largest challenges in the peanut value chain include coordination and logistics. This presents an opportunity to use digital tools in logistics

to unlock greater efficiency, with the additional effect of enhancing coordination among players. Likely to increase productivity and growth in the value chain, improved logistics will have a positive impact on farmer and processor access to inputs. Moreover, an efficient logistics sector can support access to both domestic and international customers – expanding market access for rural players.

A digital platform for logistics providers can reduce bottlenecks. A digital platform connecting farmers and input producers to logistics providers is an opportunity to enhance coordination and reduce bottlenecks in the value chain. Here, a digital platform can aggregate both formal and informal transport companies to meet the needs of the value chain participants. A platform of this nature can be used to coordinate the movement of agriculture goods efficiently between parts of the value chain. In particular, tracking parcels and vehicles can be achieved, which will equip participants with the expected arrival of inputs and allowing for proactive harvest management. Furthermore, better access to transport enables better market access, as farmers do not have to physically transport goods to farm gates. Digital services that allow farmers to request pick-ups and deliveries online have been highlighted as a particularly important way to make the agricultural processes more inclusive to persons with disabilities at the last mile (**GSMA, 2021**). Moreover, improved logistics can reduce spoilage if goods move quickly between relay points and if sensors are applied to packages – enabling atmospheric conditions to be monitored. These kinds of enhanced logistics service can be extended to other value chains too, creating efficiency gains across the agriculture sector more broadly. Yobante Express provides an example of a logistics platform facilitating services in these areas, with the potential for operations to be more deliberately expanded into the peanut (and other agriculture) value chain(s).

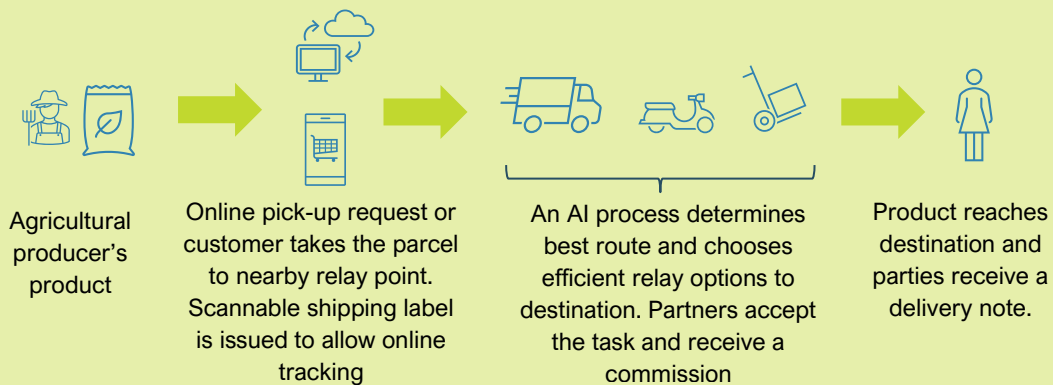
Box 6. Yobanté Express

Yobanté Express is a digital marketplace that provides logistics services to the retail, e-commerce, and agriculture sectors. It is based online and connects clients with a network of independent agents and local carriers that handle the deliveries. Packages are insured and tracked (scanned), and an AI algorithm determines the most efficient routes and relay points.

Yobanté Express offers a solution to the problem of unaffordable deliveries while creating employment for couriers. Prior to Yobanté, individuals were either paying a significant premium for professional delivery or resorting to unreliable options such as placing goods on buses heading for the desired destination.

In the agriculture value chain, Yobanté Express solves the logistical challenge of getting goods from farmers to the end-user faster and more reliably. This platform significantly reduces the costs of logistics and intermediary-related charges. Yobanté Express allows smallholder farmers from Casamance, Saint Louis, and Kolda to deliver directly from their farms to the consumer or the wholesaler. This allows for efficiency gains by increasing coordination between stakeholders, permitting better planning and improved resource allocation.

Yobanté Express can expand their business by scaling their services to additional regions and markets not serviced. Scaling could also be reached by adding proprietary infrastructure and vehicles and increasing their data-analysis capabilities. It could also implement the real-time tracing of drivers and improve parcel GPS tracking at the point of arrival.



Source: Yobanté Express (n.d.)

Digitalising logistics processes will overcome growth barriers. Key challenges to scaling logistics are access to capital and risk management. The main way in which digitalisation helps logistics in this sense is through the use of parcel trackers and vehicle telematics that monitor the speed and quality of vehicles on the road. This information can help FSPs de-risk loans and insurance products for drivers (especially in the informal sector), who are often excluded because the formal financial sector does not have enough aggregated information on the logistics sector and specific vehicles. Since companies such as Yobanté Express also aggregate drivers, it can itself help insurers to distribute insurance and other resilience-building solutions to its network of drivers, which can in turn support the resilience of the broader transportation sector in Senegal.

Scaling logistics services will create youth employment. Growing logistics services throughout the peanut value chain can improve the overall productivity and efficiency of the sector. This will encourage sectoral growth, leading to a greater demand for farmers and employees across the value chain. Furthermore, a growing and thriving value chain is likely to give rise to more entrepreneurship opportunities. Scaling logistics operations can, in addition, create direct employment as this requires more couriers, more individuals employed in cloud and user-experience programming to construct and manage logistics platforms while ensuring usability and visual appeal. Scaling also requires more data analysts to interpret insights and more data engineers to create machine learning models to optimise routes. Because of the pandemic, youths have already come to perceive transportation as a possible employer. Enhancing existing transportation companies and enabling more to be created can therefore increase employment – Yobanté Express has started to action this.

Enhancing value chain coordination through digitalisation of the central coordinating body

Digitalising the CNIA will enhance coordination through better information flows.

Digitalising the CNIA's operations should give rise to more effective coordination through improved information flows and greater connection of participants. This can be done by enabling the CNIA to communicate with value chain participants through a central platform – such as a website or a mobile application. Enabling digital information flows of this nature throughout the value chain means that players can have real-time access to pertinent information such as market prices and weather forecasts. Announcements from the CNIA can also be widely disseminated using this platform, making regulations and negotiations more inclusive of smaller players.

Promoting and encouraging the use of digital marketplaces to overcome input bottlenecks

The farmgate stage of the peanut value chain can be operated through a digital marketplace. A digital marketplace can allow processors to contact and engage with multiple farmers or peanut suppliers directly in real time. In addition, this marketplace could facilitate the advanced buying of peanuts by processors pre-harvest, helping farmers get the capital they need to farm and ensuring that not all produce gets exported. Consequently, a digital marketplace can help to deal with the constrained peanut supply faced by processors, enabling operations to return to full capacity.

A digital marketplace can reduce barriers to market access. Access to markets is a challenge for both current small-scale actors and new entrants. A digital marketplace can help to address both issues. Conducted openly and transparently, the marketplace could enable new participants to navigate and enter the value chain. Furthermore, the added convenience and ease of market access could incentivise the entry of new players (Stakeholder consultations, 2021). For small-scale participants already operating in the value chain, a digital marketplace can facilitate access to a larger customer base. To do this, current and prospective peanut farmers and processors can be encouraged to use already existing digital marketplaces in Senegal such as [Louma Mbay](#)⁴² and [Sooretul](#) (see Box 7 for more information).

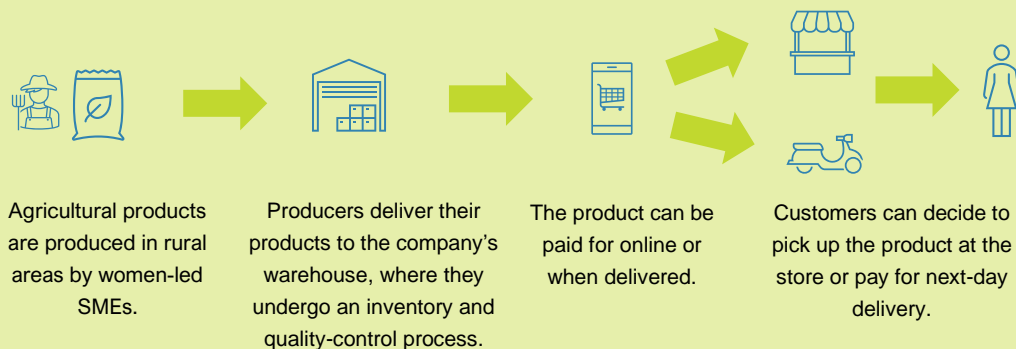
42 Louma Mbay is a digital agriculture marketplace operating under the digital platform, Mlouma. The marketplace allows agricultural producers and input suppliers to advertise and sell their products online.

Box 7. Sooretul

Sooretul, meaning “it’s no longer far” in Wolof, is a Senegalese e-commerce platform that focuses on selling processed agricultural products from local rural communities to urban consumers. The demand for organic, locally sourced products has risen across Senegal, which has opened an opportunity for Sooretul. Sooretul offers women-led SMEs, far from Dakar and other urban centres, the opportunity to showcase their products through their platform. This has resulted in an important increase in the participant SMEs’ revenues.

Sooretul gets involved in a significant part of the value chain, from sourcing SMEs and convincing them of the benefits of selling their products through the platform to branding, packaging, advertising, quality control, and customer service. In exchange, they get a percentage of every purchase on the platform. The involvement of Sooretul not only increases coordination between the different actors in the agricultural products value chain by reducing logistics and communications hurdles, but it also adds value to the products by increasing their visibility, improving their quality, and enhancing their branding.

Sooretul can increase the usage of their platform by promoting the adoption of digital tools and through digital literacy campaigns. Increasing the uptake of digital communication mechanisms among the stakeholders in the agriculture value chain could improve their coordination capacity, particularly as they expand into new regions and countries. It could also create aggregation points in new areas or build alliances with big supermarket chains. The company may also invest in its data-analysis capabilities by sharing customers’ behaviour data with their parcel delivery partners.



Sources: Spore (n.d.) and SooRetul (n.d.)

Promoting Precision Agriculture to enhance sector productivity

Precision Agriculture will increase efficiency in peanut growing. Precision Agriculture (PA) is the adoption of data and advanced technology to optimise farming processes, defined by Li as, “farming management that is performed at the right time, right place, and appropriate intensity” (Li, 2020). This creates an opportunity for PA to give rise to a more efficient use of resources in the peanut value chain. Advanced sensors and equipment can enable farmers to monitor crops precisely, reducing the misapplication of inputs and increasing crop efficiency through increased yields with less wastage. PA studies in West Africa have shown that the precision technique of seed priming increases yield between 20% and 30% (Aune & Giller, 2017). In western Sudan,

the practice of micro-dosing fertiliser increased the sorghum grain yield up to 109.7% (Ousman, 2011). Beyond optimising inputs, data collection and sharing allow smallholder farmers to benefit from the internet of things – seen in the case of Uganda through the Grameen Foundation’s Community Knowledge Worker programme (Kaji, 2016). Notably, this programme has shown that information is among the most crucial needs for smallholder farmers, with massive potential for agriculture productivity gains.

PA can incentivise youths’ entry into the peanut value chain. The digital tools required for PA could be a clear opportunity for youth entry. Agtech innovation, such as PA, has the potential to attract a younger generation to the industry, from new farmers to computer scientists, software developers, AI engineers and other experts (Schlam, 2020). These new jobs will be used to monitor crops, collect data and analyse that data. Data collection also presents an opportunity to enhance inclusivity in the sector through disaggregation by gender and disability, allowing for the needs of marginalised youths to become better seen and understood (GSMA, 2021). Youths with digital skills can help farmers directly with the collection of data needed for precision techniques. In addition, the efficiency gains from PA can serve to make the peanut value chain more attractive to youths and may shift their perspective from perceiving peanut farming as a traditional, low-income occupation to viewing opportunities in the value chain as being cutting-edge and technologically enabled.

Smaller pieces of land could be viable to farm. PA is believed to increase land productivity, increasing the economic and practical viability of farming on smaller plots of land (Aune & Giller, 2017). For youths, access to farmland is constrained in Senegal – due to privatisation, expansion of urban areas and governance (Mayers, 2017). This is particularly true for refugees, where land allocations for subsistence farming practices have been reported as being too small for their needs (Stone, 2005). Making smaller plots viable to farm through precision techniques may increase youth and refugee participation in the sector, since these groups may be more readily able to access smaller pockets of land.⁴³ In rural Senegal, land belongs to all family members and is distributed by household heads (Mayers, 2017). In the case of inheritance, dividing the crop between siblings (resulting in smaller parcels of land) could be more lucrative for everyone if precision techniques were adopted.

PA can help the value chain manage climate change. Weather information and data on soil moisture and nutrients may prove essential in the face of climate change, helping farmers to manage crop performance based on considerations of weather variability. In addition, making smaller parcels of land viable for farming a particular crop can allow farmers to diversify crops – where on-farm diversification has been noted as a promising strategy for adapting to climate change (Zonneveld & Hellin, 2020). This is because different crops can be prioritised based on the prevailing weather conditions. Farming multiple crops is already exploited by women producers in the peanut value chain:

43 Large agricultural developments and privatisation have constrained the land supply for youths. Smaller pockets of land are less likely to be viable for these large developments and therefore should be more readily accessible to youths.

“Regarding groundnut production, I can say that each woman has between 3 and 4 hectares of arable land. She can grow peanuts on one part and divide the other part between growing millet, maize or sorghum. All this, for the purposes of economic and social profitability”

- FGD participant (21-35), female peanut producer)

PA is a continuum of practices that can be adopted increasingly over time. While the tools and techniques offered by PA have clear potential to enhance the productivity of Senegal’s agriculture sector. It is also clear that the majority of sector participants are not in a position to adopt most of these in the short term due to a lack of skills, capital and awareness. These are all potential imperatives to support, but it is also important to understand that the application of digital technology to enhance farming techniques is a continuum and does not require farmers to adopt the full scope of PA approaches immediately. Far simpler applications, such as improved weather-forecasting applications, are already available and using digital technology to inform farmers about when to plant and harvest (CCAFS, 2015). Data-informed farming service-providers, such as [Tolbi](#) (see Box 8), allow farmers to access certain precision techniques without needing a large capital outlay. PA is therefore not a single, highly technical intervention but rather a range of digital tools and applications that can be adopted as and when local farmers are in a position to do so. However, support will probably be required to help local farmers reach a position where they are able to adopt many of these tools and techniques.

Box 8. Tolbi

Tolbi provides agriculture players with a wide range of technological tools to optimise and leverage their investments. Tolbi Pro is a cloud-based, AI-based image-processing platform for collecting, processing and efficient decision-making in agriculture. With drone and satellite images, Tolbi helps farmers to optimise agricultural yield by up to 30% while reducing water losses and losses linked to plant diseases.

Tolbi Pro services include:



Plant count



Land model



Yield estimator



Plant health, infestation and weed analysis



Water needs analysis

Source: Tolbi (n.d.)

6.2.2. Risks

Risk that impact would be undermined unless prerequisites met. There are four key prerequisites that have to be met for PA to have the desired effect on productivity gains:

- **Awareness and training:** awareness of and training in PA techniques among farmers needs to be fostered.
- **Capital:** a base-level of PA equipment needs to be attained prior to rollout.
- **Skills:** experts in the field of PA need to be consulted and are required to help with implementation.
- **Implementation:** with assistance, the CNIA can begin to roll out PA practices systematically throughout the peanut value chain.

The move towards digital agriculture risks leaving those not digitally literate behind.

Both stakeholder consultations and data highlight the fact that the digital literacy and digital skills of farmers are poor, especially those of farmers in rural areas. Language barriers (with applications being in French and not in local languages such as Wolof) in existing digital platforms have already presented a problem (Stakeholder consultations, 2021). Therefore, wide-reaching training interventions will be required to circumvent a digital divide. In addition, digital platforms will have to be accessible in multiple languages to ensure inclusivity.

Marginalised groups face unique obstacles to adopting digital tools. Women, disabled persons and refugees risk being excluded from digital initiatives in the sector. Affordability, skills and charging difficulties have been highlighted as key barriers to refugees' mobile phone and internet access (GSMA, 2019). While barriers to the digital inclusion of women have been relatively well documented, those with disabilities are less documented (GSMA, 2021). Persons with disabilities have been found to have significantly lower levels of mobile and smartphone ownership. This is largely due to lower levels of literacy and skills and less mobile internet awareness among disabled persons than non-disabled persons (GSMA, 2020). As such, efforts are needed to close the mobile disability gap in order for agricultural digital tools and innovations to be inclusive.

Digitalising value chains will work only as long as participants are willing and able to go digital. All the participants in the value chain need to be willing to engage with and learn digital tools, otherwise digitalisation will add no value. Gaining access to appropriate data will otherwise be a challenge for practices such as data-informed farming. This is because if farmers are not engaging with the digital tools, there will be no data to gain insights from. For this reason, advocacy of digitalisation needs to be shared across the value chain, where the CNIA will need to promote the adoption of digital tools actively.

Digital readiness of larger players may exacerbate existing barriers to entry for smaller non-digitalised firms. There is a risk of established players gaining more access to information and connections if these players are more likely to engage with digital tools. Having said that, this could also mean that the benefits of digitalisation allow large companies to employ more people as a result of business growth. Consequently, there is a need for regulators and government agencies, such as the CNIA and MAER, to ensure that the use and value of digitalisation among companies is promoted and anti-competitive behaviour is limited. This can be done through clear policies that encourage

fair and equitable access to technology and the internet. The CNIA, in particular, would need to play a role in supporting small players and facilitating open access to data and market information.

Digitalisation will not be feasible unless an enabling and inclusive ecosystem is fostered. For digitalised value chains to be enabled, suppliers (large and small) need to be incentivised to incorporate digital tools by gaining access to affordable and convenient POS devices and agents to facilitate cash-in and cash-out. In addition, bank transfers need to be more affordable and real-time transactions need to be facilitated, making digital payments easier and faster than cash payments. The BCEAO and the private sector have a clear role to play in enhancing the enabling environment in this way. Regarding identity, the issues are about being able to accept digitalised identity and digital identity proxies, accept and encourage e-signatures, and digital contracting. This requires regulations to be put in place and also relevant training and awareness-raising to occur.

Appropriate security measures need to accompany digitalisation. There need to be firmly established security measures for those sharing data and using digital tools, otherwise the sector will be exposed to the risk of cybercrime. This can be achieved by ensuring that the appropriate encryption methods have been used whenever sensitive data is stored and shared. In addition, for PA to work in Senegal, a lot of aggregated and shared data is needed. All the participants will need the assurance that their privacy will be protected and that information is not going to be misappropriated by any player, such as banks, which could use farming data to discriminate when extending loans.

6.2.3. Recommendations

Skills development

MCF can support skills development among ecosystem players to enable the adoption of digital innovation. Specifically, MCF can help with the digital skills development of farmers and processors, enabling them to use digital platforms to sell goods and access logistics services. In addition, MCF can support the skills development of farmers to incorporate PA practices.

Key skills development partners in these areas will be CNIA and ISRA: CNIA can help with the rollout of digital skills to value chain participants, while ISRA is well positioned as a research institute to be at the forefront of the move towards adopting precision techniques throughout the value chain.

Funding

MCF can support domestic innovators that are already developing context-specific solutions to the challenges identified. Local start-ups, such as digital marketplaces and logistics platforms, can be supported financially by MCF to scale their operations and reach more players throughout the agriculture sector. Specifically, start-ups such as Yobanté Express, mLouma and Sooretul present scalable business models that can enhance productivity in agriculture value chains and the peanut value chain in particular.

MCF can support the entry of existing global technologies and innovation to support local productivity. MCF can financially support the introduction of PA and specialised logistics technology into the peanut value chain. While the move towards precision techniques is likely to be a long-term process, MCF can assist the value chain with acquiring a base level of precision technology and infrastructure to leverage from.

Technical assistance

MCF can assist with enabling access to services for domestic innovators and SMEs.

Digital start-ups, such as Yobanté Express, need capital and tailored financial services to scale. MCF can assist these firms with improving their business plans and credit applications as well as enhancing digitalisation practices to help de-risk their insurance applications. Similarly, to help level the playing field between large incumbent value chain players and new entrants, MCF can assist the development of digitalisation strategies by SMEs and inform clear roadmaps for their effective adoption of digital tools. This level of intervention will help SMEs to extract greater, more targeted, benefits from digitalisation, enable fairer market competition, and minimise the potential for existing government-led power dynamics to be exacerbated within the value chain.

MCF can assist with the digitalisation of the CNIA. The CNIA lacks a base level of digital infrastructure as well as digital skills. MCF can assist the CNIA through advising the organisation on the steps to take in order to digitalise operations. In addition, MCF can commission experts to assist the CNIA with creating an open digital platform for its operations.

Advocacy

MCF can advocate public policies that support innovators. An enabling ecosystem needs to be in place for innovators to thrive. MCF can advocate the fostering of this ecosystem by advising on payments interoperability, digital identification, security measures and the broad adoption of digital tools throughout the agriculture sector.

Partnership brokering

MCF can broker relationships between innovators and the CNIA. The CNIA needs to engage with innovators for their services to be shared effectively across the peanut value chain. MCF can broker this engagement between the CNIA and key innovation partners, including:

- Yobanté Express and other local coordination services
- Sooretul
- mLouma
- Tolbi
- myAgro
- Bayseddo

MCF can broker relationships between PA experts, ISRA, CNIA and MAER. The move towards adopting PA techniques in the peanut value chain requires a high level of expertise and awareness of the practice. MCF can assist regulators and the research institute in the peanut chain with obtaining access to this kind of expertise through relationship brokering. Here, MCF can help to form the relationship between regulators (CNIA and MAER), ISRA, and leading PA experts in West Africa.

7. Manufacturing: Textiles and Apparel

The textiles and apparel value chain employs a significant portion of Senegalese women and is one of the country's historical strengths. However, the industry itself has not shown substantial growth in recent years and faces a number of challenges.

It is vital, when discussing the value chain, that we separate textiles from apparel, though they can be seen as part of one continuous process. The textile value chain consists of the processes to manufacture fabric, whereas the apparel value chain takes the fabric created and continues the process to create clothing and other items to wear. These two connected processes provide different opportunities for growth in the economy.

This section describes the textiles and apparel sector and highlights the opportunities and risks in digitalisation, before providing recommendations on how best the Mastercard Foundation can support the digitalisation of the value chain.

7.1. Sector synopsis

7.1.1. Unpacking the value chain

Three stages to textiles and apparel value chain. The value chain can be seen in Figure 13 below. The country grows a significant amount of cotton, most of which is exported: almost 8,000 tonnes in 2018 (Selina Wamucii, 2021). The cotton that remains in the country⁴⁴ is ginned and spun into yarn. Soditifex is the only large ginning company in Senegal and two large spinning companies, CCV and NSTS, spin ginned cotton into yarn: 80% of NSTS's yarn is exported (Embassy of India Dakar and Indian Ministry of External Affairs, n.d.). This high export volume leaves little locally produced fabric, and consequently designers and apparel manufacturers often rely on imported fabric (Stakeholder consultations, 2021).

44 Not all cotton, as some is used for feed.

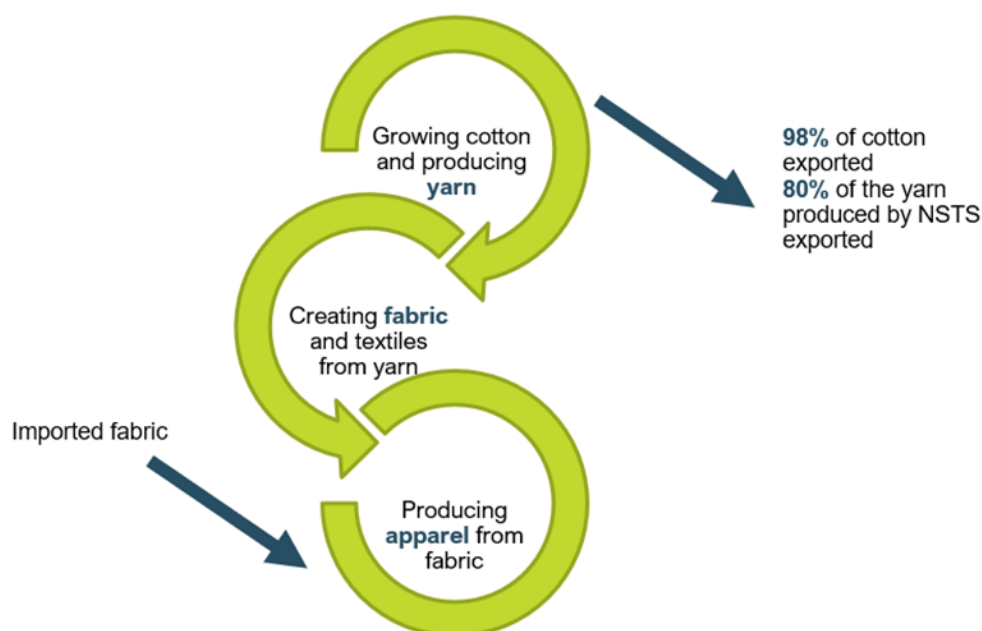


Figure 13. Textiles and apparel value chain

Sources: Osinski & Syalla (2019); Embassy of India Dakar and Indian Ministry of External Affairs (n.d.)

7.1.2. Trends

Macro and trade trends

Textile and apparel sectors traditionally strong in Senegal but weakened over time.

The textile and apparel industry has historically been a key contributor to the manufacturing sector in Senegal and reached its peak during the 1970s under a policy regime of state import substitution policies.⁴⁵ For instance, in 1975, these industries alone contributed approximately 20.4% of GDP (CEIC, 2021). By 1979, however, economic weakness⁴⁶ forced the Government to seek support from the Bretton Woods Institutions and Structural Adjustment Policies were starting to be implemented. By 1986, the New Industrial Policy had removed protection in various sectors, including textiles and apparel. The 1990s saw the country join WAEMU's common external tariff, which was a significant shock to the economy (Cisse, et al., 2016). As a result of these policy developments, the contribution of the textiles and apparel industry to GDP has fallen markedly in recent years, reaching a record low of 0.71% in 2002 (CEIC, 2021). Figure 14 provides an indication of the decline of the textile and apparel sectors according to contribution to GDP in recent years (CEIC, 2021).

45 These inward-oriented policies aimed to protect the domestic market from foreign competition in order to promote industrial production. Policies involved extensive state involvement in the economy and significant import barriers, including tariffs and non-tariff measures (NTMs) such as quantitative import restrictions and government licences (UNCTAD, 2008).

46 Wildly fluctuating GDP growth: 6.3% in 1972 to -5.5% in 1973 caused by a breakdown of political control and a breakdown of import controls, leading to significant illegal imports. By the early 1980s 60–70% of all textile goods sold in Senegal were imported illegally (World Bank, 2021; Boone, 1990).

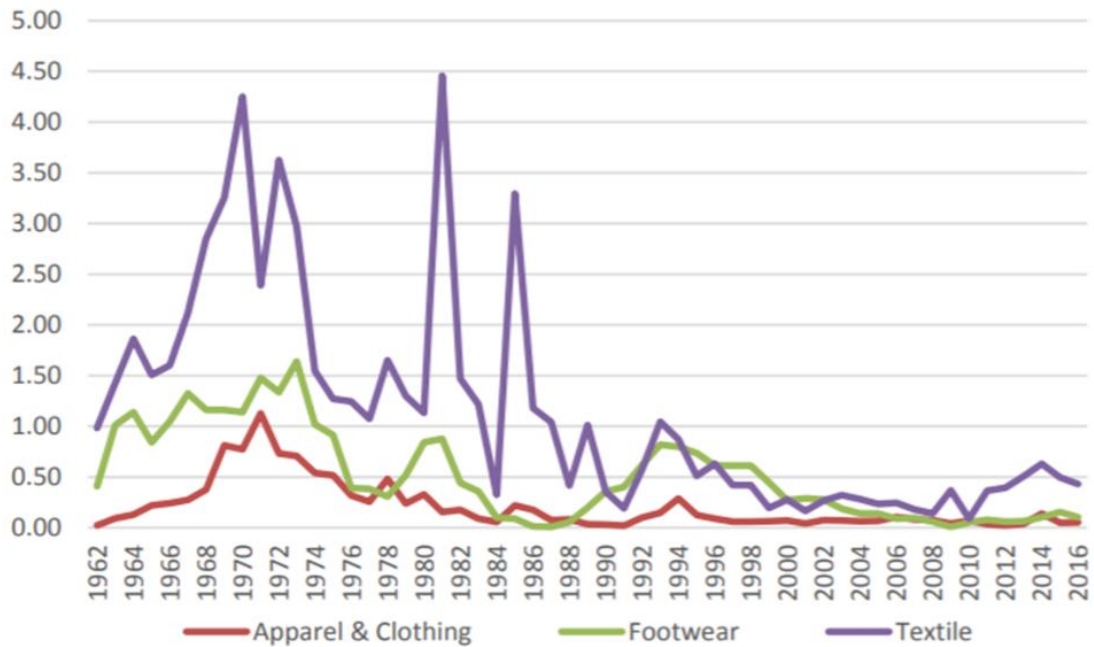


Figure 14. Contribution of textiles and apparel to GDP

Source: Golub & Mbaye (2018)

Despite trade agreements, Senegal uncompetitive, thus unable to take advantage of export opportunities. Senegal is part of three major global trade groups that provide low tariffs, simplifying exports and providing an easy market for growth. It is part of the African Continental Free Trade Area (AfCFTA). The agreement requires members to remove tariffs progressively on at least 97% of tariff lines that account for 90% of intra-Africa imports⁴⁷ (Tralac, 2021). Senegal also benefits from the African Growth and Opportunity Act (AGOA), a US law that provides eligible sub-Saharan African countries with duty-free access to the US market for more than 1,800 products, including apparel. This opens up the USD350 billion apparel market to Senegalese designers (Lighthizer, 2020). Finally, it forms part of the WAEMU customs union, which removed tariffs and quantitative restrictions on intraregional trade in 1996 (Sy & Mariama, 2016). However, to date, the country has been unable to take advantage of trade opportunities, importing USD390,665 worth of coated fabric in 2020 yet exporting only USD83,000 worth (Trend economy, 2021). The two graphs below indicate the value of the country's exports and imports of textiles and apparel.

47 Currently, the Agreement is on Phase 1, which includes goods and services. However, talks remain ongoing, with no specific provisions as yet referring specifically to the textile and apparel industries. It is too early to determine the benefits to the Senegalese textile industry, but, overall, the World Bank estimates a USD211 billion boost for the continent by 2035 (Tralac, 2021),

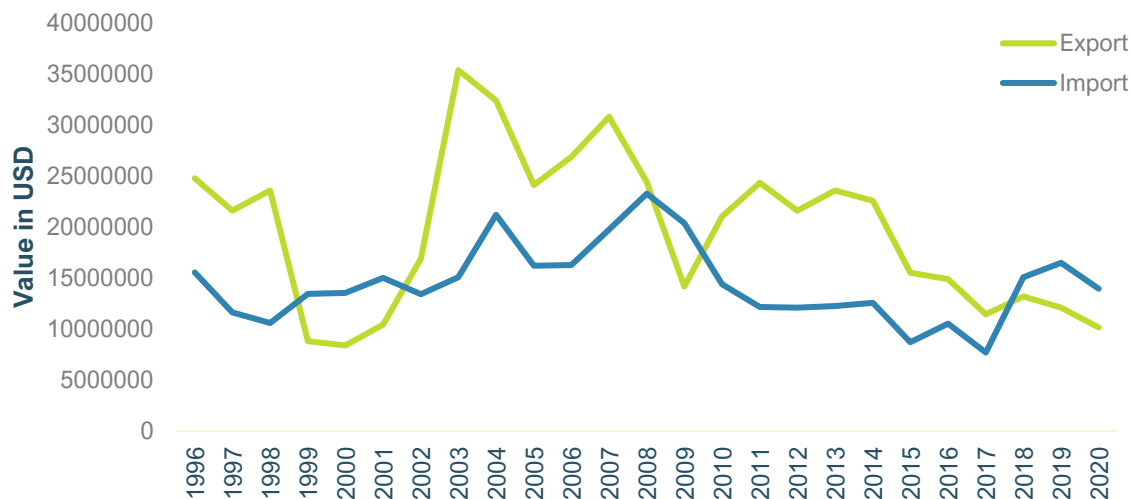


Figure 15. Cotton, yarn and textiles imports and exports⁴⁸

Source: UN (2021)

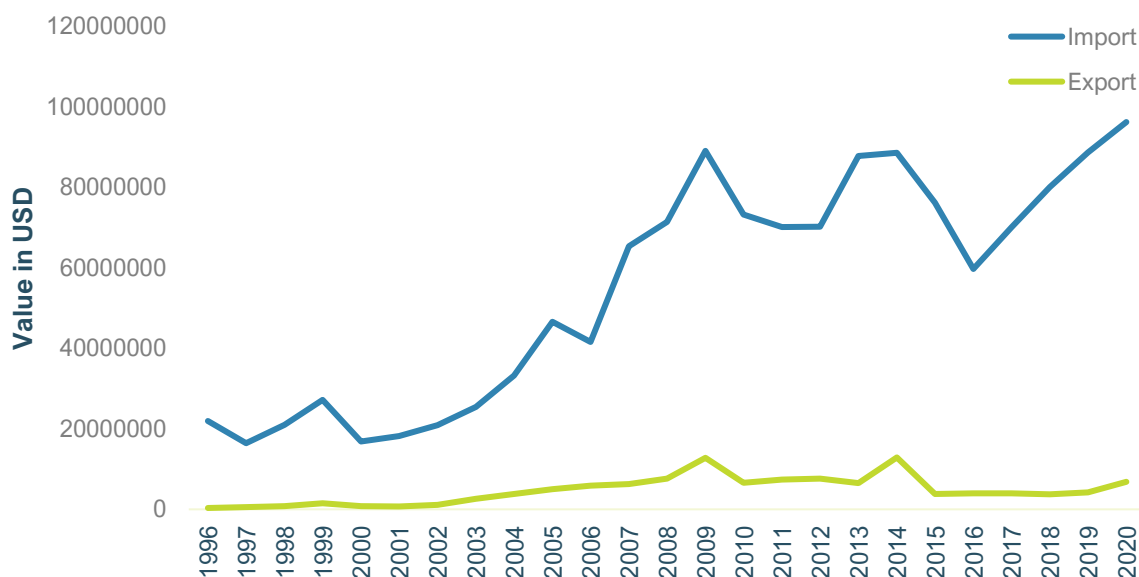


Figure 16. New and worn apparel imports and exports⁴⁹

Source: UN (2021)

48 Using the following commodity codes: 60 (fabric knitted or crocheted), 52 (cotton, includes yarn), 58 (fabrics).

49 Using the following commodity codes: 61 (knitted and crocheted apparel and clothing accessories), 62 (apparel and clothing accessories not knitted), 63 (textiles, made-up articles and worn clothing).

Textile sector dominated by females and informal SMEs. Most businesses (97.91%) in the textile sector are micro, small and medium-sized enterprises (MSMEs) and the sector is largely informal, as it is estimated that 97.3% of MSMEs are informal in Senegal (Embassy of India Dakar and Indian Ministry of External Affairs (n.d.); Sarr (2019). There were only 1,355 employees in the formal textiles and apparel industry in 2004. In 1998 it was estimated that approximately 35% of informal-sector workers were in fact involved in textiles and apparel. In 2004, there were 23,135 enterprises making and tailoring clothes and 4,964 textile craft enterprises that, together, employed an estimated 61,818 people (Bades & Barber, 2005). More recent evidence suggests that the textiles industry consists of approximately 15,000 micro-businesses (non-industrial workshops) and roughly 5,200 non-industrial crafters. There are also several hundred second-hand stores, many of which are small survivalist enterprises⁵⁰ (Embassy of India Dakar and Indian Ministry of External Affairs, n.d.). It is estimated that manufacturing as a whole (including textiles and apparel) can increase high-quality employment by 5% by 2030. This contributes 379,182 jobs to youths and 189,499 jobs to women (Dalberg, 2021).

Vulnerable groups such as refugees or persons with disabilities generally struggle to find work, textiles and apparel sector show promise. According to a 2013 article, only 20% of the people with disabilities in Senegal are employed and around 75% are illiterate (Kumar, 2013). The informal sector is therefore key for Senegalese people with disabilities. Additionally, it is conceivable that many already work in the garment industry and it has been noted that the garment industry holds significant opportunities for people with disabilities (Sekhri, 2009). For example, in South Africa the Department of Labour created Sheltered Employment Factories to provide employment to people with disabilities. These factories produced items including textiles and canvas work (Polity, 2012). For refugees, 2009 research indicates that 34.2% of foreigners (including refugees) were involved in trade and 15.4% in production and processing. This indicates that production of garments or textiles and their sale can be employers of refugees (Maastricht Graduate School of Governance, 2017).

Market trends

Second-hand market a key feature in the apparel landscape. Senegal is a significant market for international second-hand clothing. As locally made clothing cannot compete on price or quality with second-hand clothing in general, there remains a market for these goods among the price-conscious consumers (Stakeholder consultations, 2021). Second-hand clothing is particularly popular with men and children. In total, an estimated 70% of Senegalese wear second-hand clothing and roughly 8,500 tonnes of clothing are imported⁵¹ a year (Faye, 2017). The clothing is often brought in from donor organisations such as Oxfam, who import large 500 kg bales of clothing. In Senegal, the clothing is sorted into smaller bales (45–50 kg) and then sold on to resellers or wholesalers, who sell to the public or other retailers. This market provides livelihoods for thousands, with many selling in local markets or opening their own stores (Faye, 2017).

50 Survivalist enterprises started out of necessity as a result of the lack of formal job opportunities or access to markets. They differ from aspirational self-starters, who want to grow their businesses from informal to formal (Sahler & Gray, 2020).

51 Although this seems to have decreased or stopped totally due to COVID-19 (Stakeholder consultations, 2021).

Promise in high-end apparel. There is a history of traditional fabric production and traditional Senegalese clothing in the country that entrepreneurs can harness. The country has a rich tradition of design and embroidery and high-end designs using traditional techniques and styles. This type of production is particularly relevant to aspirational entrepreneurs.

Apparel shows digitalisation promise. The apparel sector holds most promise from a digitalisation point of view, given the significant interest by young men and women in fashion (designing and selling clothing). A 2021 survey suggests that 32% of youths are interested, with a stronger interest among women (34%) and younger groups; 40% of 18–24-year-olds, who see it as an attractive sector in which to start a business (Youth insights, 2021). In addition, traditional Senegalese-styled clothing has a strong market locally. The brand Touty, for example, began 10 years ago with three women but has since expanded to 24 staff members. Digital tools can help designers take advantage of international opportunities. Youths are already taking advantage of opportunities by selling on social media and designers are already using digital tools to access larger markets (Stakeholder consultations, 2021). Platforms such as Afrikrea (Box 9) have helped to show designers the benefits of digital platforms.

Box 9. Afrikrea

The Afrikrea platform is used by some designers to access larger markets. Afrikrea is an e-commerce platform that allows African designers to sell clothing, jewellery and footwear globally. It was launched in Paris in 2016 but the company has since moved to Ivory Coast. Each designer manages their shop on the platform and is charged a 10-15% commission on each sale.

It allows for credit card and PayPal payments and has a delivery partnership with DHL, an international courier. In addition, it provides a measuring and size guide to help consumers with their purchasing decisions.

The Afrikrea platform averages over 230,000 visits per month (70% of which is through mobile). There are 2,018 types of items on the site and 40,000 items in total. In addition, it hosts over 2,500 sellers from 76 countries and has over 50,000 users in 145 different countries.

Afrikrea has proven particularly beneficial for local Senegalese brands such as Debbo Dakar, a boutique that designs and sells hand-made wax clothing using traditional methods. In light of the COVID-19 pandemic, the platform enabled the company to expand its customer base to the United States as well as Western and Eastern Europe.

Source: Stakeholder consultations (2021), Afrikrea (2021) and (Afrikrea, n.d)

Weak uptake of e-commerce and online shopping, but changing due to COVID-19.

Senegalese culture is heavily cash-reliant and primarily based on face-to-face interactions. This is particularly true of apparel, where items are bespoke. In 2017, Jumia was the largest e-commerce platform, selling various items, including apparel and electronics. There were only four sites dedicated to apparel. The most popular sites (receiving more than 60% of traffic) were online classifieds (Bocquet, 2017). The Digital Senegal 2016-2025 plan sets out to strengthen e-commerce by updating the legal framework, setting up conditions for mutual operations between electronic financial services, supporting the creation of e-commerce websites, and offering the possibility of electronic payment. The plan also aims to promote the economic and social empowerment of women through e-commerce⁵² (Ministry of Post and Telecommunications, 2016). Furthermore, COVID-19 has provided a boost to e-commerce, with some active online businesses experiencing up to 50% growth during 2020 (Micro-save consulting, 2021). The Government has also understood the promise of e-commerce during COVID-19, and created an e-commerce platform for the public to buy essential goods (eTrade for all, 2020).

7.1.3. The role of policy

Policy emphasis on the revival of the textile and apparel sector. A strong will has been expressed at the highest level of the State to revive the textile industry, though there is no direct government regulation in this regard (Fall, 2018). The PSE highlights opportunities in home textiles, interior decoration, as well as luxury and traditional tailoring and embroidery. The document also speaks of government creating an enabling environment for textiles as one of the sectors presenting opportunities for the country (Republic of Senegal, 2012).

State support for SMEs in textiles and apparel sector. The ADEPME provides small business with support, with a significant number of textile businesses (~35%) accessing such support. The organisation has two major support focuses: helping SMEs and companies formalise operations (including training for entrepreneurship building and a focus on competitiveness), and providing assistance for developing new products (e.g. market surveys) and marketing services. ADEPME also provides subsidies for companies (Stakeholder consultations, 2021). In addition, the Ministry of Trade, along with the International Trade Centre (ITC), and the *International Organisation of Francophonie* (OIF) and the Ministry of Trade of Senegal, launched the Made in Senegal project to help 20 young entrepreneurs internationalise their businesses through a digital platform (International Trade Centre, 2017).

Limited uptake of Special Economic Zone benefits. Only one foreign company is taking advantage of the Special Economic Zones (SEZ) in textiles, despite the significant benefits that include income-tax exemptions, a 15% corporate tax rate, favourable employment contracts, and employee contribution exemptions. The only textile company taking advantage of this SEZ is a Chinese company that invested USD25 million in Diamniado to create C&H Garment Company (Ministère de l'Économie, du Plan et de la Coopération, 2020). The company aims to recruit and train at least 3,000 people (Diouf & Lijun, 2018).

⁵² The plan aims to have 33% of rural women using e-commerce by 2025 (Ministry of Post and Telecommunications, 2016).

7.1.4. Challenges

The sector faces a number of challenges, as outlined below.

Production challenges

Weaknesses in cotton production. Even though Senegal is a cotton producer, most fabric is imported. This is indicative of significant challenges in the production of cotton. Finance is a significant concern for farmers. For example, farmers have limited access to finance to purchase inputs despite their high costs and, because cotton is less profitable than groundnuts, many farmers have shifted their production to groundnuts. As regards labour, processing wages are higher than in competitor countries and harvesting cotton requires intensive seasonal labour, which is primarily conducted by migrant workers from Guinea-Bissau. Furthermore, production varies according to the weather, which is exacerbated by climate change,⁵³ and there is lack of trucks in production regions.⁵⁴ The result is that Senegalese cotton is more expensive than some competitors' cotton despite its quality, leading to its reduced competitiveness (Dalberg, 2021).

Numerous business challenges in textile and apparel production. A number of documented challenges impede growth in the sector and limit interest in entrepreneurs joining. They include low productivity, high labour costs and inflexible labour contracts, higher costs of non-tradable inputs, limited access to training, and a weak business climate⁵⁵ (Mbaye & Weiyong, 2008).

Business challenges facing apparel entrepreneurs

Limited access to finance. For young entrepreneurs in the apparel industry, access to financing or capital is weak. This is exacerbated by limited information-sharing about financing opportunities and also the high level of informality of the sector (Stakeholder consultations, 2021). Moreover, stakeholder consultations suggest that insufficient French language skills by entrepreneurs in the apparel sector may limit their access to start-up capital from French investors.

Established industry practices limit potential to reach larger, more diverse markets. Stakeholder consultations and insights from Section 4 indicate that a significant number of designers and small apparel businesses rely on social media as key channels to market and sell to customers and to communicate with them. In most cases, though, this is quite informal, with WhatsApp being used as the dominant communication channel with customers. While this is a positive step towards digitalisation, relying only on WhatsApp largely limits designers' reach to geographically proximate consumers that are already within their network. It is also onerous and time-consuming for designers to engage directly with each individual consumer. Moreover, their reliance on WhatsApp communication is an indication of the general informality and limited professionalism in the industry.

53 In 2018, Senegal experienced its third severe drought in six years, after 2011 and 2014 (Reliefweb, 2018).

54 Cotton is grown in nearly every region of the country, although production is concentrated in the south-eastern part of the country, south of the Kahone–Tambacounda belt and in the Casamance and Kédougou regions (Ndiaye, 2007).

55 As documented in several firm level surveys (Golub and Mbaye, 2002; Mbaye, 2003; Mbaye, 2006) undertaken in the sector from the end of the 1990s (Mbaye & Weiyong, 2008).

Difficulties serving international customers

Cross-border payments a challenge in Senegal, driven by regulatory challenges.

Bank-to-bank transfers suffer from a lack of transparency, long settlement periods and limited accessibility. High transaction costs are also a significant challenge: a transaction from a local bank account in Germany to a bank account in Senegal can incur costs of more than EUR100, depending on the transaction value, and take up to seven days to settle (Seeh, 2021). As banking, digital payments and electronic money are regulated by BCEAO and not the Senegalese Government, companies are forced to comply with cumbersome regional regulations or wait for new regulations to be issued (Stakeholder consultations, 2021).

Poor logistics facilities make deliveries expensive and unreliable. International delivery from Senegal is unaffordable for many designers. While a cheaper, informal alternative is sometimes used by shipping goods with flight attendants who take items in their luggage, this is an unreliable method (Stakeholder consultations, 2021).

Language limiting opportunities. Many designers are unable to speak English and French, which limits their access to international clientele and suppliers. More than 30 languages are spoken in Senegal, with Wolof the most popular. Although French is the official language, only 15% to 20% of all men and between 1% and 2% of women are fluent in it and an additional 21% of the population is partially fluent (Pariona, 2017). The inability to speak global languages limits access to the international market for a significant portion of the population. Even for those who are fluent in French, the potentially reachable global market excludes the large English-speaking market.

Coordination challenges

Limited coordination in sector. Different large textiles and apparel federations exist in Senegal. The Federation of Associated Creators and Couturiers of Senegal, for example, has over 300,000 members. The federation claims to be the number one employer for young people, since each tailor has at least five apprentices (Diouf & Lijun, 2018). Many of the members are women. However, there is no government-mandated coordinating body and the apparel federations are reportedly fractured, underfunded and inefficient, with some designers being unaware of their existence or the support they provide (Stakeholder consultations, 2021). There are also smaller groups such as Atelier 221⁵⁶ but because of their size, their benefits are limited. As outlined above, ADEPME currently provides support but little in the way of co-ordination despite the fact that they are open to all MSMEs in the textiles and apparel sector. In addition, its only presence is in Dakar, and it has faced a number of financial challenges historically. These challenges could be a contributing factor to the low level of financial support provided to MSMEs (Stakeholder consultations, 2021).

Digital support initiatives by the Government have limited reach. The Government has attempted to connect entrepreneurs to buyers via the Made in Senegal digital platform. However, the platform was designed for only 20 MSMEs, across different sectors (International Trade Centre, 2017). There has also been limited information-sharing to promote the platform and the associated assistance opportunities. The next sections will

⁵⁶ A collective of 17 designers who developed a Made in Senegal label. They decided to get together and organise events, panels to discuss the difficulties, capacity-building and personal development (emediia, 2019).

explore the ways in which the digitalisation of processes using digital tools can help to make apparel more competitive globally, and cheaper and more efficient locally.

7.2. Role of digitalisation

The synopsis of the textiles and apparel sector and associated challenges and presented in Section 7.1 indicates that the textiles manufacturing component of the sector remains likely to struggle over the medium term. The high costs of production in Senegal make it globally uncompetitive – to the extent that most fabric used by local designers is imported. Whereas there is undoubtedly the potential to enhance the efficiency and productivity of this sector with the adoption of digitally enabled automation, the reality is that Senegal's industry has a long way to go to catch up, requiring substantial capital investment. Furthermore, investing in greater automation may enhance productivity and competitiveness, but would also probably come at the cost of jobs in what is a highly labour-intensive industry. This indicates that Senegal will probably be better served by managing the ongoing decline of the textiles industry and planning for the re-skilling or other support of workers who lose their jobs over time than to prioritise the digitalisation of the textile manufacturing sector.

The apparel component of the sector, however, shows far greater opportunity for growth in niche markets, particularly for exports. Digitalisation, through digital tools, e-commerce and digital payments, can unlock opportunities for growth in both domestic and global markets.

The potential opportunities and risks related to digitalisation are described below, as a basis for concluding with key recommendations for supporting the role of digitalisation in generating dignified and fulfilling work for youths in Senegal.

7.2.1. Opportunities

Digitalisation creates opportunities on several fronts:

Production efficiencies

Digital printing can unlock efficiencies for fabric manufacturing. Digital printing offers fabric producers a means of finishing more fabric more efficiently and consistently, in a more environmentally friendly way. Digital textile printing is an alternative to conventional screen printing for fashion and home furnishings as it is more flexible, quicker and helps maintain standards. Therefore, designers are able to get products to market quickly and take advantage of trends which can help them grow their businesses (Fibre2Fashion, 2005). In addition, this method uses less water and electricity and eliminates effluent discharge, making it significantly more environmentally friendly than traditional methods (McKeegan, 2018). Therefore, digital printing can improve printing consistency and give Senegalese designers a point of distinction internationally as a green textiles and apparel producer. However, this opportunity is geared more towards high-end or larger businesses and is less labour intensive.

Digital tools can benefit designers. Digital design tools are popular internationally and can contribute to the Senegalese apparel sector. Internationally, most designers use clothing design software or graphic design software to create their fashion sketches and the use of such digital tools is preferred (and often required) by manufacturers. Digital drawing and sketching are viewed as one of the top ten skills of the future needed by designers (Motif, 2021). Software can be free and open source, such as Valentina, Tailornova, and Blender; or paid, such as Clo and Snap Fashion (Good Firms, n.d). Free and open- source software can be of broad-ranging benefit in Senegal, including for refugees and potentially persons with disabilities, due to the lack of cost and efficiencies they create. These types of software are easy to understand and manipulate to create different versions of the same item by allowing designers to change the colours and fabrics of the design easily (Digital Fashion Pro, 2019). This technology can create a number of efficiencies. For example, OptaCut helps designers minimise fabric waste and Garment Designer is a pattern-drafting programme that allows designers to use ready-to-wear or custom measurements (G2, 2021). Furthermore, digital sketches allow manufacturers to recreate designs better, ensuring better quality (Digital Fashion Pro, 2019) and creating opportunities to pitch designs to global buyers. However, designers require the skills to use these types of digital tools. In Senegal, organisations such as Senfablab⁵⁷ offer training to women in these types of skills.

Digital market participation

Digital platforms offer a significant opportunity for designers to reach new and larger consumer groups. As discussed in Section 7.1.4, Senegalese designers do use digital channels for marketing, sales and communication with customers, but their use and understanding of digital tools remains narrow and limited primarily to social media. Using social media to conduct business does provide designers with an opportunity to showcase designs to an online audience, such as through Instagram or Facebook, and enables digital communication with customers through WhatsApp. These benefits are particularly pronounced for groups such as refugees or people with disabilities as it lowers the cost to entry, reduces physical barriers and designers can work and sell from home. However, social media platforms have generally not been built to encourage the development of businesses, whether locally or internationally. Platforms such as Instagram, for example, cannot facilitate logistics, aggregate payments or provide efficient communication channels. Furthermore, costs for official advertising can be relatively expensive, with Instagram charging fashion brands up to USD3.50 per click (Advertise. Grow, 2021). Platform participation allows businesses to expand and manage a higher frequency of orders and a larger clientele. Websites or platforms such as Jumia can help by formalising what happens over social media, creating efficiencies in communication and information-gathering. Participation on a platform also signals that enterprises⁵⁸ are “official”, which builds trust. Moreover, allowing consumers to buy online increases local and international market as sales are no longer limited by location. The African Development Bank

57 Senfablab is an association with funders in France who offer training in robotics, embroidery, carpentry, and shoe making. They train women to use digital drawing tools and machines but also basic literacy skills (Stakeholder consultations, 2021).

58 There are many instances of fake enterprises advertising on social media that are accepting consumer payments and not supplying a product.

recognises the potential of digital platforms to increase market size and help coordinate the sector and so has funded the creation of the Fashionomics platform (see in Box 10).

Box 10: Fashionomics

Fashionomics is an AfDB-funded platform for high-end designs made in Africa that connects African designers with consumers, mentors and investors around the world. It enables consumers to buy apparel from African designers, including online payment and DHL delivery (at a special reduced rate). It also promotes designer events with its networks and has a database of funders for designers to contact. However, no Senegalese designers are selling from the platform at present.

Source: Fashionomics Africa (n.d.)

Clothing size standardisation can facilitate digital platform engagement. Senegalese clothing is often made to order; therefore there is no standard sizing. This makes it difficult for businesses to produce their designs ahead and cater for an international audience. It also makes it challenging for consumers to buy clothing as they cannot correctly judge their size, leading to significant back and forth between designers and buyers (Stakeholder consultations, 2021). Making effective use of digital platforms therefore requires sizes to be standardised.

Language tools can help unlock international market access. The use of international languages such as English and French will help local designers access the international market and they may be able to leverage global technologies, such as translation tools, to help.

Digital logistics has significant benefits for consumers and merchants. Digital platforms can simplify delivery and ensure greater efficiency. Without reliable and cost-effective delivery, local designers cannot be competitive internationally. A digital platform can aggregate delivery options, simplifying the delivery process for both the buyer and the seller. In addition, digitalised logistics systems contribute significantly to the reliability of delivery. Through information management and parcel tracking, designers know that their goods are delivered in a timely manner and intact and to the correct individuals. This can in turn help designers manage the expectations of their clients. Digital tracking also expedites the delivery of supplies for businesses.

Payment facilitation

Interoperable digital payment options can increase consumer access to local apparel and reduce value chain inefficiencies. Most designers do not have POS terminals and rely on cash (Stakeholder consultations, 2021). Furthermore, for designers serving global consumer markets, cross-border payments are a substantial challenge in Senegal. Regulation and limited provider options mean that cross-border payments are both slow and expensive. Digitalising payments facilitate easier access to international and local customers and suppliers. Digital platforms with back-end payment aggregators can help to facilitate interoperable payments. This allows customers to pay with any

mobile money wallet or bank account. In addition, as bank account ownership is low, it is vital that a variety of payment methods are accepted. EFTs can be inconvenient and the ability to pay via digital proxies such as QR codes can be significantly more convenient for consumers. These additional, and interoperable, payment methods allow more consumers to access the market easily.

Digitalising payments offers opportunities for additional financial services. Credit uptake in Senegal is low, with only 2.83% of the population having credit cards in 2017 (The Global Economy, 2021). Digitalising payments can enable designers to offer their customers ancillary financial services, notably lines of credit as an additional way to attract and retain customers, or even to access financing themselves. For example, MTN and AFB Bank in Ghana launched Qwikloan, an instant way to access a cash loan of up to GHS1,000 (USD175), at any time for any purpose from a mobile phone (Ghana Chamber of Telecommunications, 2021).

Easing cross-border payments will allow local designers to compete internationally beyond West Africa. Payments on digital platforms help to create a seamless experience for international consumers. Cross-border payments can be done in a multitude of ways. If stakeholders beyond traditional banks (such as MNOs and fintechs) allowed them, it would open up the competitive landscape for cross-border payments and most likely reduce costs.

Market development

Scope to expand the second-hand clothing market. The use of digital platforms and social media can help to unlock markets for young women already engaged in selling second-hand clothing in Senegal. Many women sell second-hand clothing in person and as a result have faced severe impacts to their business in consequence of COVID-19. Leveraging digital platforms such as Facebook market-place or bespoke platforms such as YAGA (as seen in Box 11) allows these young entrepreneurs to resume business and reach larger markets. Again, easy digital payments are key. In addition, logistics remains important to ensure that buyers from all regions of the country can use the platform.

Box 11. YAGA

YAGA is an Estonian platform that has expanded globally to allow consumers to buy and sell second-hand clothing, including in South Africa. The process for buying and selling is simple, and the platform protects both buyer and seller, helping to build trust. Once a buyer has found an item, chosen a transportation method and made a payment, the money is deposited into YAGA's account. The item is then shipped according to requirements and once the buyer confirms receipt of the item, YAGA transfers the money to the seller. The amount transferred to the seller excludes a fee of 9% of the total transaction amount (which includes 5% for payment processing). Delivery is an additional cost that is paid at checkout and consumers can choose between three delivery options that range from free to ZAR99.99 (USD7). Consumers can choose to pick up their purchase from the seller, pick it up from a local store through the PAXI network,⁵⁹ or door-to-door delivery. They can pay for their purchase by credit card, EFT payment or their Yaga wallet.



Sources: YAGA (2020) and YAGA (2021)

Value chain coordination

Digitalisation can help boost efforts to coordinate the value chain. As discussed in Section 7.1.4, coordination is currently limited and there is space for an agency such as ADEPME to take a leading role in effecting digital coordination between players. A digital coordination mechanism can help connect funders to businesses and promote vertical integration and efficiencies, as designers are able to learn from each other or to pool resources for equipment or advertising. Furthermore, presenting training and showroom opportunities on the platform reduces information asymmetries and allows those in the apparel sector to upskill and take advantage of digital or other opportunities. It would be particularly beneficial if the training were tailored (and promoted) to differently sized SMEs to increase skills in the sector, allowing entrepreneurs to take advantage of different opportunities.

7.2.2. Risks

In addition to the opportunities outlined above, digitalisation also poses a number of risks to the textiles and apparel sector:

Digitalisation and automation present a risk for the least skilled. Work in the textile and apparel industry is labour-intensive, drawing labour from marginalised individuals with fewer transferable skills. This includes those with low education, low income or in specific

⁵⁹ PAXI is a South African counter-to-counter parcel service that allows consumers, agents, suppliers and institutions to send, collect and return parcels to and from more than 2,000 PAXI points around the country (PAXI, 2021).

regions, or the elderly. Therefore, while digital technology and processes may benefit a number of designers and businesses in the industry in Senegal, there is also a high risk of some segments falling behind and losing their jobs. This is particularly the case with SMEs, who do not have the financial resources to invest in digital tools. For refugees and people with disabilities, this is also a significant concern as they often lack access to education, with 66% of children with disabilities aged between 7-16 years old not in school, compared with 37% not in school for Senegal on average (Handicap International, 2020). Refugees also face significant challenges, due to their poor economic status. Furthermore, Parschau & Hauge (2020) found that 98% of apparel work content is automatable and there is an 89% likelihood of automation for sewing-machine operators. In Bangladesh, for example, it is estimated that roughly 60% of garment workers will be replaced by robots by 2030. In addition, 85% of American jobs lost in manufacturing between 2000 and 2010 were due to the productivity growth of robotics and machinery (Apparel resources, 2019). Workers manually producing textiles and apparel can therefore lose out on employment they had traditionally been engaged in. In addition, efficiencies in larger producers can limit the opportunities of SMEs. Training and increased access to digital tools may help mitigate the risk of marginalised groups falling behind.

Current purchasing culture can limit uptake of digital methods. The strong current cash-based ecosystem limits the use for digital payments. Designers may not see the value of using digital platforms for payments due to their low usage and high cost (despite the time saved and opportunities it provides). Consumers may also prefer the larger cash-based ecosystem and feel uncomfortable using digital payment methods due to a lack of trust in the system. This would limit the benefits and efficiencies that digital payments offer and limit local designers' ability to tap into regional or global markets. Fostering trust in digital payments and increasing its use case so its use becomes ubiquitous may help to minimise this risk. This can be extended to cross-border payments.

ADEPME support not targeting informal designers but larger firms. The support provided is currently limited to registered MSMEs. Even then, there is little awareness of the organisation and the support provided falls short of what is required (Stakeholder consultations, 2021). A risk is that the support provided and the additional coordination support targets only registered SMEs, thus excluding a large proportion of emerging (informal) designers and risks further deepening the advantage of larger, established apparel manufacturers. To mitigate this risk, ADEPME support can easily be accessed by informal MSMEs. In addition, the Government could use this opportunity to support organisations already working in the space, such as GIZ or USAID.

Trade risks. There is the risk of trade agreements not being enforced or altered, making it harder to access international markets. Therefore, despite digital platforms facilitating payments and logistics, international consumers are less likely to purchase from Senegalese designers due to high import taxes.

Insufficient cross-border payment infrastructure. As discussed, there is no cross-border payment system outside the WAEMU that is accessible to most of the population. While money can be sent to the region from outside, the converse is possible only through banks (Stakeholder consultations, 2021). This limits access to the international market but the more international players who operate in this market, the more access to new cross-border payment corridors can be expanded.

7.2.3. Recommendations

In light of the opportunities and risks outlined above, what role can the Mastercard Foundation play in facilitating the optimal role of digitalisation for the creation of jobs in the textiles and apparel sector in Senegal? This section breaks down recommendations for the Mastercard Foundation according to the three roles it can play in the sector.

Advocacy

Promoting a more efficient payment infrastructure. Weaknesses in payment ecosystems, including cross-border payments, need to be redressed to take advantage of digital opportunities. There is a role for the Mastercard Foundation to advocate or lobby BCEAO to play a more active role in implementing key regulations and providing a more supportive environment. There is also a strong need to advocate more partnerships between banks and non-bank providers to allow designers and consumers greater access to international payments.

Support development of textiles and apparel-specific policy. The Mastercard Foundation can support the Government in developing a specific textiles and apparel policy that sets out a plan for digitalising the sector, as well as for the ways in which the Government can be more involved in implementing support initiatives in the sector. The policy should take account of the current support provided to the sector, such as by ADEPME and current players that can support the value chain.

Partnering

Supporting digital platforms for designers in Senegal. The Mastercard Foundation has the opportunity to partner with current initiatives such as the Made in Senegal platform or Fashionomics to help identify gaps and further opportunities for digitalisation. These platforms are not yet widely used by designers and there is a significant opportunity for them to grow. Part of supporting these platforms could be brokering partnerships with logistics companies for efficient delivery.⁶⁰

Supporting coordinating infrastructure. For ADEPME to play a coordinating role it requires a digital operating platform. The Mastercard Foundation can support the development of such a platform through funding or technical assistance.

Partnering with training providers. The Mastercard Foundation can partner with training organisations such as Senfablab or ADEPME to upskill those in the sector as well as provide training to those left behind in the process of digitalisation, especially small informal businesses, refugees and young Senegalese with disabilities. This can either be through funding or through designing or promoting various training initiatives. Training can include website design and digital marketing, and using new or available platforms. In addition, training can also be on the pre-digital skills, such as basic literacy, required to take advantage of opportunities. Such training, facilitated or enabled by MCF, can also help to address power dynamics in the value chain that either implicitly or inherently favour larger, more formal businesses, by channelling more direct support to young, emerging designers.

⁶⁰ Fashionomics, for example, has a partnership with DHL that allows designers to ship clothing at reduced rates.

Funding

Funding the development of local second-hand platforms. The Mastercard Foundation can support the clothing market (both of designers and second-hand resellers) by funding or supporting local innovators to develop a digital platform for resellers and by ensuring that the platform accepts or facilitates mobile money payments – as bank account ownership is low. These platforms should be multi-lingual to promote usage among multiple groups.

8. Tourism

The tourism and hospitality industry is a significant generator of employment in Senegal, with much potential for increasing market access and efficiencies through digitalisation. However, the sector is also vulnerable to shocks – as the COVID pandemic has shown – and has struggled to break into the international market at scale.

This section describes the trends and challenges facing the tourism sector in Senegal as a basis for identifying the opportunities and risks posed by digitalisation. It then formulates recommendations for the potential role that the Mastercard Foundation can play in leveraging digital technology for the growth of dignified and fulfilling work in the sector.

8.1. Sector synopsis

Sector within the purview of multiple actors and coordinating bodies. The tourism sector policymaker is the Ministry of Tourism and Air Transport. It has the following actors under its supervision:

- Tourism Regulation Directorate
- Senegalese Tourist Promotion Agency
- Senegal Airports Agency
- National School of Hotel and Tourism Training
- Society for the Development and Promotion of the Coasts and Tourist Zones of Senegal
- Air Senegal
- Aviation Handling Services
- Agency for Air Navigation Safety in Africa and Madagascar
- Blaise Diagne International Airport Project Company
- Tourist Police Unit

Given the multitude of actors involved, the management of the sector is fragmented, with no clear, unified approach to developing the sector and making Senegal a more competitive and attractive destination.

A significant employer, mostly of females. Estimates suggest that before COVID-19 around 420,000 people were formally or informally employed in the sector (Dalberg, 2021). Of these, the bulk are women (85% female employment) and 44% are young employees (ANSD, 2017). Some 97% of jobs in tourism are estimated to be informal. Formal employers in the sector include Air Senegal (providing 300 direct jobs), 123 travel agencies, 353 accommodation establishments, 245 restaurants and catering businesses, as well as six parks and natural reserves, and sole proprietors – such as 1,167 licensed tour guides and artisans (World Tourism Organisation, 2021). Most formal employers are larger hotel chains, with only a very nascent start-up entrepreneurship scene⁶¹.

61 Examples of tourism start-ups include [Bonjour Senegal](#), [Teranga Hospitality Solutions](#), [ACO Senegal](#), [Sendrive Solutions](#), [Sunu Trip](#).

Stakeholder interviews suggest that many entrepreneurs do not consider tourism a viable sector in which to pursue start-up ventures, given the lack of capital, the seasonality (there are 30% more tourists in high seasons relative to low seasons) and the lack of a structure in the sector to access support (Stakeholder consultations, 2021).

France main source of international visitors, but COVID-19 shifted focus to local market. Visitors from France make up 33% of international airport arrivals, followed by Guinea (5%), the Gambia (5%), Nigeria (4%) and Spain (3%), with the rest of the world making up the remaining 50% (World Travel & Tourism Council , 2020). Historically, Senegal has focused quite substantially on France as its main tourism market. COVID-19 has brought the focus back on local travel and, with the long recovery period ahead, domestic travel and hospitality will probably increase in importance (Stakeholder consultations, 2021).

Ecotourism shifts focus away from beach resorts. Senegal is established as a seaside destination, its comfortable climate attracting visitors to its beaches that span more than 700 km of the coastline (Horwath HTL, 2018). Tourist offerings were therefore mostly limited to the coastal areas. However, coastal erosion (as a result of rising sea levels paired with construction along the coast) has resulted in coastal towns losing access to many of their useable beaches and being left with only rocky shores (World Bank, 2015). Consequently, the sector has seen a shift away from the beach resorts towards more diversified offerings inland, including cultural experiences and ecotourism⁶² (Stakeholder consultations, 2021).

Dakar as regional business hub. Dakar is a popular destination for business travellers, being a regional hub for conferences at its International Conference Center. The demand for accommodation and leisure activities in Dakar is growing for businesspeople attending these conferences, with 1,869 new hotel rooms under construction in 2020, making Dakar the city in Africa with the 10th highest number of hotel rooms planned for 2020 (W Hospitality Group, 2020). Many of these projects are currently on hold due to COVID-19.

Significant contribution towards GDP. The tourism sector contributes approximately 8.8% to GDP – almost as much as the entire primary sector (which includes agriculture, fishing and mining) at 10% (WTTC, 2019). It is also one of the main sources of foreign exchange revenue (World Bank, 2020). The National Tourism Policy, which resorts in the PSE, aims to make the tourism sector an engine for growth, foreign currency generation, and employment. The policy has an objective of welcoming three million tourists per year. It aims to achieve that goal by means of the development of new tourism clusters as well as by revamping existing tourism sites with a focus on seaside resorts, ecotourism, cultural and religious attractions, and business tourism (Republic of Senegal, 2012).

62 For example, Spain's Riu Hotels & Resorts chain has purchased a 25-hectare site in the Pointe Sarène area on Senegal's west coast to build at least two new hotels. These are set to open at the end of 2021 and the hope is that the employment opportunities related to artisanal crafts, cultural experiences and local food supply chains will increase for the locals. The new Saint Louis airport is set to open by the end of 2021 to help service the forthcoming offshore oil and gas project. This will bring economic activity to the Saint Louis area and will benefit both leisure and business tourism. The natural wonder tourism of bird migration and the desert ecosystem in Louga could be tourist attractions for these business travellers.

Before COVID-19, the sector had been on a recovery trajectory. After a boom in the late 1990s, the sector stagnated in the 2000s. The reasons for the stagnation included (Horwath HTL, 2018) (jeuneafrique, 2015):

- Limited investment in the sector
- Worsening coastal erosion
- An Ebola threat coming from the Gambia
- Ongoing conflict in the Casamance region relating to the region's independence
- High airport taxes, making flights significantly more expensive than to neighbouring countries
- The introduction of a biometric visa, which caused significant delays at the airport due to undertrained staff
- The bankruptcy of Air Senegal (twice), which cut off the Casamance region from the rest of the country

Around 2015, the sector started to benefit from multiple PSE initiatives to attract more visitors, including: the abolition of the tourist entry visa, reductions in passenger charges and security fees, the extension of a VAT rate of 10% to all tourist services, and a significant decrease in the stamp duty on airline tickets. As a result of these initiatives, the sector had been recovering up until the travel restrictions that resulted from COVID-19.

COVID-19-induced job losses expected to exceed 80%. Between March and June 2020, the hospitality sector in Senegal suffered a total revenue loss of USD160 million and the air and transport sector USD47 million (World Tourism Organisation, 2021). The effects of the pandemic have been devastating for the industry, with a downturn in employment projections, which initially averaged +13% growth between 2014 and 2019, to -82% in 2020 as a result of COVID-19 (Dalberg, 2021). The Ministry of Tourism and Air Transport (MTTA) injected approximately USD142 million to protect jobs in the sector from the impact of COVID-19, given the importance of the sector to the economy (World Tourism Organisation, 2021).

8.2. Challenges

Apart from the climate change and COVID-19 challenges noted above, the sector also faces a number of market challenges:

An uncompetitive international destination. Despite the PSE initiatives to make Senegal a more affordable destination, the country is still significantly more expensive than its neighbours. It is not only expensive for locals to travel but increasingly international visitors are also taking advantage of cheaper alternatives such as the Gambia and Cape Verde, which, according to stakeholders, can offer better value for money and higher-quality hospitality.⁶³ Abidjan is increasingly trying to establish itself as a business hub in West Africa and hence Senegal will also experience higher competition on the business travel side (Stakeholder consultations, 2021). With COVID-19, this problem will only be exacerbated if more policy action is not taken to make Senegal more competitive. Yet the

63 It costs more than double for a Boeing 737 to land in Dakar (USD9,725) than in Banjul (USD4,191), which is only 168 km away (World Bank, 2020). The West African average total airport charge in 2017 for a Boeing 737 (arriving internationally) was USD7,671.

initiatives under the PSE are implemented only slowly and with a sense of a lack of direction and implementation. While the overarching goals are aligned, the sector is fragmented and in dire need of investment (Stakeholder consultations,2021).

Limited market investment and activity. The Senegalese economy has seen a significant rise in foreign direct investments (FDI) in recent years.⁶⁴ However, these investments have not directly translated into accelerated private-sector activity in the tourism sector.⁶⁵ For local tour operators accessing the market is quite challenging, because 80% of the leisure tourism market in Senegal is supplied by European tour operators (World Bank, 2020). Limitations related to market access, environmental degradation and generally limited personnel training and skills affect players in the Senegalese tourism sector negatively.

Limited high-end tourism options. In addition to Senegal's being comparatively unaffordable for the local traveller, there are also limited high-end tourism offerings available to high-income visitors. Consequently, there is a need for more luxurious offerings in addition to quality training for students to enable them to meet the needs and expectations of their clients (Stakeholder consultations, 2021).

Travel infrastructure nascent. The transport infrastructure is not conducive to moving easily to and from the various tourist attractions throughout the country. It is challenging to move between regions as they are not well connected by road networks, and transport options for tourists are limited. It is estimated that up to 25% of paved roads and 53% of unpaved roads are in poor condition. Less than 15% of Senegalese live near a stretch of at least 5 km of roads (Brookings, 2021). More than 37% of tourism and hospitality firms identify transportation as a major constraint (World Bank, 2015).

Low levels of digitalisation. The sector lags behind in its adoption of digital tools. The online visibility of tourist businesses is low and the presence on international platforms such as Airbnb or Booking.com is lacking. Of tourism firms, 77% use emails to communicate with clients and/or suppliers, yet only 52% of firms have websites – illustrating that the digital marketing of tourist offerings is not being leveraged to its full potential to attract visitors (World Bank, 2020). The most common communication tool used by service providers to connect to tourists is WhatsApp and marketing is done typically by word of mouth. For marketing purposes, Instagram is on the rise, but still nascent. The informal nature of bookings decreases trust on the part of visitors who are not familiar with the local culture and it is risky for providers (Stakeholder consultations, 2021).

Most tourism information available only in French. Stakeholder consultations suggest that there are limited tourism offerings and information available in languages other than French. A lack of especially English information about local tourism options, English-speaking tour guides and adherence to international standards in hospitality can act as a deterrent to non-French-speaking visitors.

64 Between 2006 and 2015, Senegal's FDI as a percentage of GDP trailed below the SSA average. However, over the 2016–2019 period Senegal's FDI has consistently outperformed SSA, reaching 4% in 2019 (compared to an SSA average of below 2% of GDP) (World Bank, 2019).

65 As noted above, private-sector players have been constrained by a number of factors, including beach erosion, which has been occurring in the cities of Saly and Casamance; expensive air travel due to high airport charges, and a lack of financial infrastructure (World Bank, 2020).

International digital payments expensive. Most payments in Senegal remain cash-based. For tourist bookings in advance, providers lament the high cost of accepting international payments. A lack of infrastructure to accept credit card payments and perform international money transfers restricts access to a wider international market. Most bookings of tourist offerings locally are done via WhatsApp, and payments are facilitated locally via digital wallets. Trust in international payment solutions is only nascent and the high cost acts as a deterrent to digitalisation of the sector. Providers report that making and accepting foreign payments is a major obstacle to their business (Stakeholder consultations, 2021).

Sub-standard customer service. Customer service is considered to fall short of international standards, failing as it does to meet the expectations of international visitors (Stakeholder consultations, 2021). The skills gap (in years of schooling completed versus years of schooling required for the position) ranges from four years (dishwashers) to nine years (lodging managers). The skills gap for hosts and hostesses, restaurant cooks, hotel desk clerks, waiters and waitresses, bartenders, food preparation workers as well as food service managers is seven years (Brookings, 2021).

Graduates lack adequate digital skills. In addition to the lack of hospitality skills of staff, tourism graduates do not have the necessary digital skills to perform their jobs (Stakeholder consultations, 2021). Most opportunities in the sector require at least some level of digital skills (Daly & Gereffi, 2017). Some of the key digital skills required include: navigating reservation management and room assignment software; conducting remote or online sales and customer service; operating point-of-sale devices; coordinating food supplies; and digital check-in and check-out.

Starting a tourism business not attractive to young people. The youths regard the tourism sector as the least attractive in which to start a business, with only 10% of the youths sampled in the consumer research conducted for this study willing to consider starting a business in the sector (Youth Insights, 2021). There are also only a few start-ups to serve as innovation demonstration cases for firms or entrepreneurs in the sector that are looking to leverage digitalisation.

8.3. Role of digitalisation

Digitalisation has the scope to help overcome a number of the challenges outlined above, but it also comes with corresponding risks. Below, we consider the opportunities and the risks in turn, and then conclude with key recommendations for unlocking tourism growth via digitalisation.

8.3.1. Opportunities

Expanding user-friendly online presence of tourist offerings. Globally, social media has become increasingly central to any leisure and business tourism offering. To highlight Senegal's unique nature and culture and set itself apart from competitors, its online and social media visibility needs to be expanded. Therefore there is a major opportunity for social media marketing and for increasing the availability of websites for all types of tourism. Moreover, by offering tourist information in languages other than French, Senegalese tourist offerings will appeal to a broader range of tourists. This opportunity entails not only

translating existing information into multiple languages, but also developing the language skills of tourism graduates so that they can interact and communicate with tourists in their native languages. Especially for youth with physical disabilities but who are able to access the internet, creating online content and managing an online presence can offer important employment opportunities, given the reduced access barriers.

Expanding the market through digital platforms. There is an opportunity to increase visitors to Senegal by improving the linkages of Senegalese tourism market players to international booking platforms, such as Airbnb and Booking.com, whose presence in Senegal is still nascent. Doing so will increase the online findability of Senegalese offerings. There is also an opportunity to expand local digital platforms aimed at online bookings, such as the examples outlined in Box 12. Furthermore, digital platforms can be expanded beyond online bookings to link local value chain actors. This can range from helping the youths to find employment in the sector to offering local food suppliers an online presence to sell produce to local tourism establishments, and to linking local food suppliers or logistics providers to local tourist establishments. The channel of communication does not need to change: tourists can still communicate with service providers via a channel of their choice – for example, WhatsApp – but there is an opportunity for the visibility and findability of service providers to improve, and for this process to be formalised.

Box 12. Senegalese booking platforms

Case study: Bonjour Senegal

Bonjour Senegal is a digital platform that links tourists to hotels and also to leisure and travel opportunities. The platform enables customers to compare different offers and make bookings and payments without having to go to the individual websites of different businesses. Bonjour Senegal plays a crucial role for tourism businesses in enhancing their findability and simplifying the booking and payment processes for their clients. The platform is accessible to international and local clients who make use of card payments as well as local clients who make use of mobile money. Despite a less than ideal environment for start-ups in the sector as far as infrastructure and ICT conditions are concerned, Bonjour Senegal illustrates not only the possibilities but also the benefits of leveraging digitalisation in the sector.

Bonjour Senegal receives, on average, 1,500 visitors to its website every month: 60% of that website traffic is local (Senegalese), with 20% and 10% of visitors hailing from France and the United States respectively. The remaining 10% of visitors come from all over.

Case study: Taamu Senegal

As a response to the impact of the COVID-19 pandemic on the sector, the Senegal Tourism Promotion Agency recognised the importance of promoting Senegal actively for the purpose of rebuilding the sector. Consequently, the Agency launched the Taamu Senegal platform in June 2020. The platform aims to promote tourism offerings to Senegalese businesses (both public and private), both residents and expatriates, with

the aim of redirecting travel and tourism plans for outside of the country to national sites and offerings.

Source: Stakeholder consultations (2021)

Overcoming digital payment challenges. There is a substantial opportunity in reducing the barriers to accepting and making digital payments, particularly international payments. Travelling with cash is unsafe and the ability to book and pay for trips securely in advance is an advantage. Local digital wallets are not accessible to international visitors and so here there is an opportunity to expand solutions for both online and in-person digital payments.

Tourism experiences for all wallet sizes through tailored trips. Stakeholder consultations suggest that there is a lack of both high-end luxury options and affordable or low-end tourism solutions. This presents an opportunity to offer bespoke travel packages that speak to any level of affordability. Digital platforms can offer the ability to tailor individual trips based on the traveller's needs and interests, and can showcase local offerings that may be off the beaten track. In addition, tailored tourism helps to guard against the seasonality of income generation in the sector. Furthermore, it offers an opportunity for value chain actors to connect to one another to jointly build a tailored experience, and to organise themselves better as a service-provider network.

Improving customer service to match international standards. There is an opportunity to increase Senegal's attractiveness through improving customer service. Language skills, but especially internationally accredited hospitality training, are most essential. Such training can be done locally if added to the curricula for tourism studies courses but also through online courses with mentorships in order to assess students' abilities and their progress.

Upskilling students with a future in tourism through digital TVET colleges. The opportunity presents itself to develop tourism students' digital skills through offering educational tourism content by means of digital channels. This provides students who are interested in employment in the sector but who live in rural or remote areas and who may not have access or transport to tertiary institutions with a chance to upskill themselves for future employment. Online trainings would also enable those youth with physical disabilities to access more education.

Leveraging digitalisation to create entrepreneurship opportunities for rural youths. As the sector diversifies and opportunities arise to attract tourists to more rural and remote areas, digitalisation offers an opportunity for rural youths to establish their own income-generation through ecotourism and cultural exchange. Young people are passionate about solving problems in their rural communities (Stakeholder consultations, 2021). Assistance in solving local problems (such as through waste management or renewable energy solutions) could help to create local ecotourism attractions, which could in turn attract more young people to an entrepreneurship path in tourism. There is also the potential to attract young people to start tourism businesses by highlighting local potential and giving exposure to local solutions and use cases. This could help to close the urban-rural gap by exposing and equipping rural youths to solve local problems and at the same time to generate income.

Positioning tourism as a catalyst for value-added services. Tourist trips can be linked to local offerings, such as shopping for artisanal goods and crafts, unique cultural experiences, and local traditions – for example, through homestays. This linkage could help to develop and sustain employment in remote areas.

8.3.2. Risks

Uncertainty regarding the timeline and future impact of COVID-19 on the sector may affect investment. The uncertain timelines regarding travel allowances and requirements, border closures, vaccines and possible further waves of COVID-19 infections in future have all exposed the fact that the tourism sector is particularly vulnerable. Private investors may be weary to invest in the sector for the foreseeable future, or at least until there is a better understanding of the timelines affecting travel, and this could have an impact on job creation.

Constraints on investments in infrastructure. Without substantial investment in road and air infrastructure, there is a risk that efforts to promote entrepreneurship and employment will not materialise in areas that are hard to reach. Stakeholders revealed that planned investments in the sector were delayed due to COVID-19 and that there is a risk of a further diversion of funds if tourists do not return as quickly as hoped.

Lack of implementation of policy activities. The recovery from COVID-19 is likely to be slow and, given the fact that Senegal’s competitiveness vis-à-vis its neighbours was already in decline prior to COVID-19, the sector is in dire need of diversification and innovation. However, while the PSE provides a solid policy framework, the slow pace of activity implementation to achieve results could make Senegal lose further ground compared to its competitors. There is a risk that activities aimed at digital transformation and employment creation will fall short of expectations if Senegal’s competitiveness is not increased.

Absence of consumer recourse to guard against fraudulent tourist offerings. There is currently no avenue for consumer recourse, should a tourist suffer a loss as a result of fraudulent tourist offerings online. This risks undermining trust in digital platforms (Stakeholder consultations, 2021).

Cash preferred over digital payments. There is a risk that local tourism providers or clients will insist on cash even if digital payment options are available because they perceive cash to be free (Stakeholder consultations, 2021).

Environmental degradation and exploitation. There is a real risk of environmental degradation as tourists visit parts of the country that were previously undisturbed. This would be similar to the way coastal erosion was exacerbated by the uncoordinated and aggressive construction activities following the beach resort boom. In addition, there is a risk of exploitation of cultural heritage when opening such experiences to tourists.

8.3.3. Recommendations

What could MCF do to capitalise on the opportunities and mitigate the risks highlighted above? Below, we outline recommendations for four different roles MCF could play in the digitalisation of the tourism sector:

Funding role

Enabling digital payments. MCF could support tourism merchants with appropriate digital payment capabilities and/or link them to low-cost digital payment partners.

Developing translation and interpretation technology. A specific initiative could be to scale the initiative Cracking the Code for a Multilingual Africa to develop a speech-to-text dataset to enable translation and interpretation technology to better translate and interpret Wolof.

Relationship brokering role

Linking value chain actors. MCF could help to link the offerings of various tourism service-providers to improve the overall value proposition for tourists, as well as attract more clients for the service-providers. This could be done by using a digital platform through which tourists can select tour packages which are made up of offers from various service-providers.

Building an online platform for employment opportunities in tourism. It could also directly develop and host an online platform listing tourism-sector employment opportunities and linking employers and job-seekers, with a special focus on vulnerable youth, such as refugees and people with disabilities.

Creating digital accreditation of international tourism standards. MCF could partner with the Ministry of Tourism and Air Transport to develop a digital accreditation of international tourism standards for local tourism offerings. This would provide tourists with the peace of mind that there is a low risk of fraud when transacting online, and allow them to expect international standards of tourism and hospitality when dealing with an accredited service-provider.

Advisory role

Promoting the benefits of digitalisation. MCF could convene the tourism industry at large on digitalisation, including by sharing its benefits, conducting training on how to digitalise various components of the tourism offerings, illustrating successes through use cases, and sharing free resources. This could take the form of hosting a digitalisation expo. So far, the sector and its actors has been fragmented with numerous umbrella organisations and informal players, which makes it tricky for government to find the right entry point for conversation and the strategic implementation of the actions set out in the PSE. Convening the private and public sector players for dialogue and partnership building can be an important function of MCF given the disconnect between different value chain actors to date.

Creating entrepreneurship programmes with a focus on rural tourism. MCF could create online entrepreneurship programmes that focus on rural tourism in order to encourage entrepreneurship and provide both tourism and business skills development for rural youths. This would enable the youth to solve problems that matter in their communities and also contribute to making their microeconomies sustainable.

Training role

Improving language skills. MCF could fund the training of unemployed youths who are interested in working in the sector in foreign languages to equip them with sufficient language skills to enter the workforce and liaise with tourists. The training could be conducted both in-person and online to ensure that it is accessible to youths located in various parts of the country.

9. Recommendations and scenarios

The sections above outlined several recommendations for unlocking the role of the digitalised economy in sector development and the generation of dignified and fulfilling work in each of the focus sectors. Across the sectors, a number of cross-cutting imperatives can be identified for interventions at the public- and private-sector level, respectively.

A critical underlying assumption throughout this report and particularly throughout this section is the transmission mechanism through which youth jobs are likely to be created. As illustrated in Section 2, the assumption underlying this study is that the effective adoption of digital innovation will result in greater productivity in the focus sectors and also in the economy more broadly. Greater productivity will result in the growth of these sectors and, by extension, greater global competitiveness for those sectors and enterprises engaging in trade or competing against imports. The growth of these sectors, and the economy broadly, will in turn create new work opportunities, both through the growth of existing enterprises and with the entrance of new players. However, it is also critical to remain cognisant that the nature of digital innovation is such that a significant portion of the productivity gains are derived from enhanced labour productivity – hence the gains in productivity do not equate directly to the creation of new work. Neither will the effects be the same across different economic activities and sectors. Nevertheless, the overall growth is expected to create a net increase in work opportunities.

The pathways to these effects are further explored through the remainder of this section. The section is divided into three parts:

- First, we consider the public-sector imperatives for supporting the enabling environment for digital innovation.
- Next, we conclude about the imperatives for direct support to the development, adaptation and adoption of digital innovation in the economy.
- Next, we model the potential employment impact of successful implementation of either the public or the private imperative sets, or a combination of them.
- Finally, we outline specific support opportunities for the Mastercard Foundation.

9.1. Supporting the enabling environment for digital innovation

Public-sector imperatives focus on both the role of regulators and regulation and that of policymakers and policy in creating an enabling environment for digital innovation across the focus sectors. Regulation and policy should work hand-in-hand to reduce or remove barriers to responsible digitalisation, create an enabling environment and facilitate innovation and digital solutions to existing real-economy problems.

9.1.1. Imperatives

The key public-sector imperatives to enable the productive and responsible digitalisation of the Senegalese economy include:

Advancing digital payment interoperability with non-bank payment providers as key participants. As highlighted in Section 3, notable steps have been taken in the past five years to promote the interoperability of digital payments, yet a lack of interoperability between mobile money operators and banks, and among mobile money schemes, remains a key challenge to digital payments as a facilitator of digitalised economic activity. Interviews with MMOs and digital entrepreneurs in Senegal reveal that the ongoing closed-loop nature of banking and mobile money offerings, such as Orange Money, continues to limit the convenience and willingness of consumers to engage with digital payment solutions; it also increases the transaction cost to send value to recipients through specific payment channels and reduces the availability of alternative non-bank payment channels, such as PayPal, to prospective international consumers. Furthermore, in the absence of open APIs and more ubiquitous payment channels, innovation by payment fintechs is also undermined, and this further limits access to new non-bank payment options, (Stakeholder consultations, 2021). This creates an imperative to expedite the adoption and enforcement of digital payment interoperability regulation to optimise and better leverage the existing regional switch for enhanced interoperability.

Unlocking cross-border trade through more accessible and affordable international money transfer corridors. The ability to facilitate electronic international money transfers easily and affordably is essential to the development of a thriving e-commerce and e-trade industry. However, a number of hurdles still exist that hamper the ability of entrepreneurs and businesses to make and receive payments within and outside the WEAMU region.⁶⁶ While individuals may be able to transfer money between their foreign and their Senegalese accounts using the same bank, this process can be costly and disincentivises repatriation when doing business internationally (Stakeholder consultations, 2021). This creates an imperative to revise cross-border electronic transaction regulations so as to stimulate e-commerce growth – in line with objectives set out by the Senegalese National E-Commerce Development Strategy. Required revisions include evaluating the criteria for capital controls, adjusting foreign exchange transaction costs for improved affordability, opening up licensing requirements for non-bank providers to facilitate cross-border e-money payments and harmonising legislative or regulatory frameworks across the WEAMU regions for more timely, convenient and affordable regional electronic transactions. These reforms will require considerable institutional capacity on the part of BCEAO as well as players from the Senegalese digital financial system, making this a longer-term imperative. In the meantime, effective industry engagement and regulatory guidance can help to foster understanding and mitigate implementation risks.

66 At the global level, hurdles include regulations that restrict foreign transfers to only authorised commercial banks located in Senegal, prohibit e-money transactions going in and out of the WEAMU region, and limit international money transfers to only a few corridors – namely, France and countries within WEAMU (BCEAO, 2017; BNP Paribas, 2019). Within WEAMU, a lack of consistent and/or uniform national and regional regulatory frameworks, together with a lack of coordination and cooperation between national and regional legislators, also inhibits the extent to which firms can operate and move money electronically across borders (UNCTAD, 2020b).

Building a digital identity system. The analysis reveals that individuals and businesses experience challenges in accessing formal services (particularly financial services and government support) due to a fragmented national identification system. A digital identity can serve as a digitalisation catalyst by forming the basis of enabling growth in secure online platforms, which can be used to participate in economic activity.⁶⁷ Utilising such a solution can boost inclusion by allowing for individuals to be identified reliably and remotely, facilitating access to a variety of digital services across civil society, health, education, employment and finance. Digital identity systems are platforms that pull together identity information from different national identity schemes, such as ID cards, passports, biometric information (fingerprints, iris scans, voice recognition) to establish a robust and unique digital identity that is ideally usable for a variety of use cases spanning civil and financial services. The advantage is that these identities can be verified online and hence do not require physical interactions or physical documents. For those without access to national ID cards, such as refugees or people without birth certificates, the platform can be used to create a robust identity over time based on transaction history or GPS location instead of proof of address, for example. This identity proofing has large potential to enable the digital inclusion of marginalised groups in society over time (Cooper, et al., 2020). The development and implementation of a digital identity system therefore remains a long-term imperative.

Facilitating electronic signatures and digital contracting. A digitalised economy requires the ability to contract digitally. As discussed in Section 3, the existing regulatory framework does not fully regulate electronic signatures as it does not explicitly allow digital contracting. This creates a significant obstacle to any digital business interaction, including remote work, and to access to financial services. The development of a facilitative regulatory framework for electronic signatures and digital contracting would therefore be important to unlocking the full potential of the digitalised economy across the focus sectors. Once allowed, electronic signatures and digital contracting will also need to be accepted by the market. Creating an ecosystem that relies on electronic signatures will depend on actors such as courts, government offices, and businesses starting to use and accept them regularly. This will require advocacy and coordination on the implementation of digital contracting frameworks. Moreover, for digital contracting to become entrenched, it is necessary to establish regulatory bodies and transparent rules to settle disputes in the event of inappropriate use of electronic signatures and investing in campaigns to boost their utilisation.⁶⁸

Implementing forward-looking data governance. Data and the effective flow and use of data are central to the digitalisation of the economy. To ensure that data can be used effectively to support economic and social development, a deliberate data governance focus is needed over the medium term. It should cover at least two critical aspects:

- **Data protection.** Apart from the real risks to individuals arising from the ineffective protection of data, data breaches and fraud can lead to a lack of trust by consumers in using digital channels or tools.

67 The implementation of digital ID solutions in emerging economies is stated to have the potential to help unlock economic value of around 6% of GDP by 2030 (McKinsey Global Institute, 2019).

68 One instrument that can serve as a guide to achieving the effective and widespread use of electronic signatures and digital contracts is the African Union Convention on Cyber Security and Personal Data Protection (African Union, 2020). This convention establishes provisions related to electronic signatures and contractual obligations in electronic form, in addition to provisions related to personal data protection, cybersecurity and the fight against cybercrime. As at May 2021, this convention had not entered into force but has already been ratified by Senegal.

- **Data as a barrier to competition.** Just as with payment interoperability, the network effects of client data manifest in barriers to competition. The more clients you have, the more data you have, meaning that you have a greater ability to use that data to serve customers and attract more customers – similarly resulting in competitive disparities between those players with many clients and large volumes of data and those without. In this way, data ownership can serve as a barrier to entry, a barrier to competition, a barrier to innovation and therefore a barrier to greater value for consumers.⁶⁹

Countries that are proactive in developing clear data governance frameworks that both protect users and facilitate the open sharing of data will be more attractive to innovation, encouraging local entrepreneurs and global innovators to operate locally. However, developing a robust, implementable data governance framework, with buy-in and contribution from all the key stakeholders, is not a quick win. It is therefore a critical priority to begin the process as soon as possible, to ensure that Senegal is not left behind. Doing so requires a collaborative approach between public and private stakeholders from the policymaking, regulation, industry and civil-society spheres. See Annexure 4 for more detail in this regard, as well an overview of an international example of how an open data policy can be leveraged to remove data access as a barrier.

9.1.2. Implementation challenges

Translating the cross-cutting public-policy imperatives into action will face at least two implementation challenges:

- **Regional vs national dynamics:** Many key regulatory frameworks, especially for financial services, are developed and implemented at a regional level. This means that regulation is slow to change, creates the risk of regulation not aligning with local policy and, combined with the civil-law system, makes it challenging to accommodate unforeseen innovation. We assume that Senegal will remain part of WAEMU, so balancing national and regional dynamics would require engagement with regional, as well as national, regulation to support regulatory adaptation.
- **Implementation and enforcement of high-level policy and legislation.** As the analysis has shown, high-level policies and legislation are often already in place to respond to or cover key regulatory aspects. However, there are often gaps in implementation – a result of capacity constraints and a lack of coordination.

Need for holistic governance approach. The combination of these dynamics creates an imperative for a holistic approach to governance on the key areas of focus. Governance should be seen as an alliance between government, private sector and consumers to set and abide by mutually beneficial rules that are effectively enforced. The implication is that governance on key societal developments, such as payment interoperability or data governance, is not purely the responsibility of regulators. A narrow regulatory approach will often be less effective,⁷⁰ even if regulation is easier to adjust than a holistic governance approach that achieves the buy-in of all stakeholders. Effective governance requires policy leadership, regulation and supervision, corporate governance and

69 With the rapid digitalisation of economies globally, further accelerated by COVID-19 restrictions on physical movement, this dynamic is manifesting rapidly. However, economic efficiency requires providers to compete on the quality of their products and service, not who has the most data.

70 In Kenya, for example, following a new regulation requiring interoperability between mobile money providers, Safaricom “hid” the option for their consumers to transfer to other providers in the 7th level of their USSD menu. Regulation, by itself, was therefore not effective in achieving the desired results.

cooperation, as well as the incorporation of individual consumer voices or public opinion. For a robust and healthy governance framework, all of these groups need to play their role and be incentivised to comply with it.

9.2. Direct support for digital innovation

The second set of imperatives highlights the key support required for private-sector players to develop, adapt their practices and processes, and adopt digital innovation, namely:

Supporting local cross-border trading enterprises to strengthen linkages to global digital networks and platforms. Across the focus sectors, improving the online findability of firms selling goods and services, plus enhancing the channels through which they are able to reach and connect to their customers, are major opportunities for leveraging digital technology for growth and efficiency gains. At the simplest level, making effective use of online marketing requires the development and management of a website, a digital tool that is currently still underutilised in the focus sectors.⁷¹ And online presence and online marketing would also be strengthened by more firms tapping into centralised, global platforms that aggregate various industry players.⁷²

While tapping into these global networks offers significant opportunities for Senegalese firms, it also means that these firms are essentially competing globally. Therefore, firms will need effective marketing to differentiate their offerings, plus they would need to ensure high-quality service. Businesses could be supported in this quest through direct support to establish an effective online presence, training to update websites, platform postings, etc, as well as training in how to market and differentiate their service effectively. In addition, a major opportunity for growth lies in greater targeting of non-Francophone customers. Digital translation tools already provide the ability to communicate with non-French speakers, but these can be further supported and adopted.

Supporting the development of local digital innovators to develop context-specific solutions to enhance the productivity of local priority sectors. The ICT sector fulfils a critical support role in digitalised economic activity. Therefore, while the growth of the local ICT start-up sector will not be a major direct contributor to employment, it is nevertheless a critical sector to provide support to. The digital solutions and innovation developed within this sector will be a major engine for productivity gains, growth and ultimately employment generation across all other sectors. Supporting local innovation is particularly critical in the development of context-specific solutions. The unique regulatory, infrastructural and cultural context of Senegal (as with any country or society) means that context-specific solutions, or at least unique adaptations to existing solutions,

71 The tourism analysis showed that only about half of Senegal's hospitality providers currently have a website of any kind. For overseas travellers, a website adds credibility and builds trust in a service provider. It also provides key information, such as contact information and pricing, to enable tourists to make informed decisions and bookings.

72 In the tourism sector, global platforms such as Booking.com and Airbnb aggregate the market for travellers seeking guesthouses or short-term rentals. To tap into this global network of travellers, Senegalese providers would need to ensure they are part of these networks. To achieve this requires certain prerequisites, such as the ability to manage online bookings, process cross-border payments, communicate in the language of the platform, and ensure that their value offering stands out to potential travellers. Similar dynamics play out, at least to some extent, across most sectors that engage in cross-border consumer trade. In the apparel value chain, selling products via online marketplaces, such as Jumia, can unlock access to a far larger potential market.

would be required.⁷³ This includes creating a supporting and enabling environment, as outlined in Section 9.1, both in terms of enabling regulation but also proactive engagement, support and clear communication from supervisors and policymakers. A proactive stance by key regulatory authorities and policymakers to support and encourage responsible innovation acts as a strong signal to potential technology entrepreneurs and incentivises more young people to drive entrepreneurial innovation. Beyond creating a strong enabling public environment, the development of an ecosystem that is favourable to start-ups is critical. This requires working with incubators, tech hubs and accelerators to support early stage innovators to access capital⁷⁴, provide them with training and mentoring, and provide legal counselling and support to aid in navigating regulatory requirements.

Encouraging global players to enhance the productivity of local priority sectors through digital innovation not available in Senegal. Not all, or even most, digital innovation needs to be developed locally. Digital solutions to many of the challenges facing enterprises operating across Senegal’s productive sectors already exist elsewhere in the world. Some of these may need to be contextualised to fit the Senegal environment, but the core digital technology and innovation can be directly imported.⁷⁵ “Importing” digital innovation can be approached in two complementary ways:

1. ***By incentivising global innovators to establish operations or distribute their innovation in Senegal*** – for example, by addressing well-established costs and risks for enterprises to enter,⁷⁶ or through direct financial incentives to shift the risk–reward equation for potential entrants. Non-financial support such as regulatory guidance, consumer research or similar can also de-risk an investment by a potential innovator. Parc des Technologies Numériques (PTN) already provides an example in Dakar of how this objective can be supported. PTN aims to promote the relocation of ICT enterprises to Dakar by providing high quality infrastructure and working with Government and other partners to create an enhanced enabling environment.
2. ***By supporting Senegalese youths to learn from global innovation***, such as through scholarships and financial support to study at global learning institutions, or by supporting internships at global digital technology players.

73 For example, Cyrofill has developed as an alternative solution for farmers to access key inputs, such as seeds and fertilisers, that are otherwise centrally controlled in Senegal and often in short supply. Similarly, the need for translation services into local languages, such as Wolof, is specific to Senegal.

74 Access to capital is the most common constraint identified by entrepreneurs globally, and for Senegalese entrepreneurs the lack of financing options designed to their needs and circumstances, especially on the pre-seed and seed stages, is also an important barrier to developing a business (World Bank, 2019). Almost 40% of Senegalese entrepreneurs indicate the lack of access to capital as the central factor constraining their growth (World Bank, 2019). Stakeholder Consultations (2021) emphasise that Senegalese entrepreneurs are largely not able to access sources of funding outside of Francophone countries because of the language barrier. Greater access to translation tools, together with support provided by local innovation hubs, accelerators and similar entities, has the potential to open up access to sources of capital from other regions.

75 For example, the use of digital technologies to facilitate PA to benefit local farmers already exists in many parts of the world. This innovation does not need to be developed locally. The potential employment creation from developing these technologies locally is minuscule in comparison to the benefits in both productivity and employment from importing the innovation.

76 Including navigating and complying with local regulation, set-up and marketing costs, the tailoring of services to the local context etc.

Supporting targeted vocational training initiatives that develop the necessary skills for local value chain players to effectively adopt digital innovation to enhance their productivity. The need to develop and access key skills is widespread and well established in the Senegalese economy. There are undoubtedly many fundamental improvements to be made to the efficacy and quality of basic education; but as these require long-term, structural change, more immediate opportunities are to be had from targeted vocational training initiatives to generate the practical skills required by Senegalese enterprises. The TVET system has already begun trialling these kinds of solutions, and this can be further built on by identifying key growth sectors to focus on and the specific skills required,⁷⁷ and then to develop a blended learning approach to inculcate those skills, combining online learning in an optimal way with in-person tutoring.⁷⁸ It would be important to develop certification for the training developed in this way in order to add to the credibility and desirability of the training. The Ministry of Employment, Vocational Training, Apprenticeship and Integration has recently devised a strategy for the development of digital technology in vocational and technical training. It will be important to understand the details of this strategy to align planned actions with the government's plans.

9.3. Scenario modelling

If the public and private sets of imperatives as outlined above each represent a pathway to impact – with impact defined as the creation of dignified and fulfilling employment opportunities via digitalisation – then how will such impact pan out across the focus sectors? And how can one estimate the potential size of the employment impact?

In this section, we take the two broad sets of imperatives as the two parameters of uncertainty to implement a scenario modelling exercise that illustrates the potential impact pathways from the implementation of the recommendations as set out above, as well as to estimate their potential combined effect.

We identify three scenarios, as depicted in the diagram below:

- Under scenario 1, progress is made towards meeting the public imperatives, but there is no specific emphasis or implementation to achieve the private-sector imperatives.
- Under scenario 2, the focus is on private-sector imperatives, while limited progress is made towards improving the enabling environment.

⁷⁷ As discussed in Section 5, most digitally enabled jobs require workers to be able to use the digital tools relevant to their specific activity. For example, digitally enabled graphic design may be important to support advertising and brand-building in the tourism and apparel sectors, but is likely to be largely irrelevant in agriculture sectors. Digital skills should not be regarded in isolation, however. Greater adoption of digital innovation by enterprises across sectors will also necessitate the development of other skills. For example, in services sectors such as tourism, where customer ratings are a common feature of digital platforms, high-quality customer service skills will be critical. A lack of such skills will create greater and more immediate reputational risks than in a primarily analogue environment. Research has shown that targeted digital skills training tends to be less effective than embedding digital tools as part of core training modules – such as being required to submit assignments in soft copy via email (Bester et al, 2020).

⁷⁸ Online training has developed rapidly over the past decade, further boosted by the global pandemic. Accessing training online theoretically allows local young people to access a selection of the best training courses available globally. However, pure online learning tends to have high dropout rates and is also challenging for participants with limited pre-existing digital skills. A blended approach that draws on the material from online courses but includes offline engagements through mentoring and tutoring relationships, and undertaken with other groups of students, may offer an improved solution. These types of arrangement already exist in Senegal, but can be scaled further and applied across a range of targeted skills.

- Under scenario 3, both the public and the private imperatives are largely achieved.

The fourth, blocked out, quadrant represents the baseline or status quo situation where none of the imperatives are successfully implemented.⁷⁹

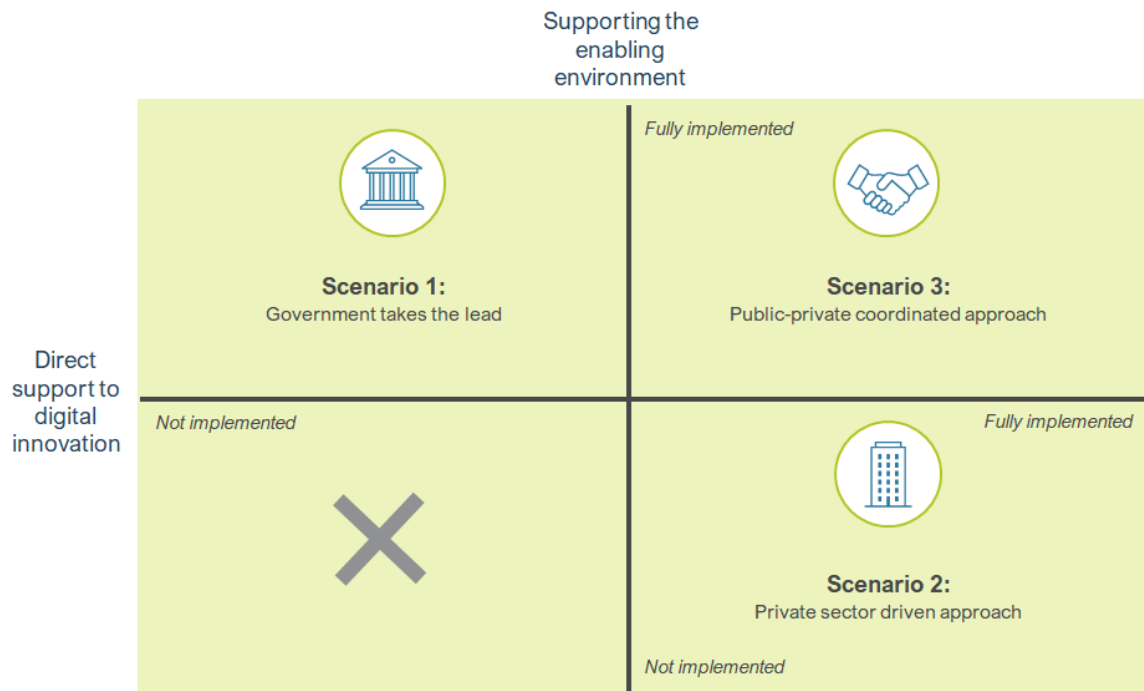


Figure 17. Scenario parameters

Source: Authors' own

In the sub-sections to follow, we consider each scenario individually, outlining what the scenario would entail and how this could play out to 2030 across the Senegalese economy and society. We then consider the impact of the scenarios on each of the three focus sectors: peanuts, textiles and tourism⁸⁰. Finally, we combine the impact on the creation of dignified and fulfilling work for youths across the three sectors and extrapolate the effects in these three sectors across the rest of the economy to illustrate how the three scenarios could influence youth employment to 2030.

⁷⁹ While this is a possible scenario, it is assumed that the impact on youth employment will be relatively limited. More importantly, however, the primary purpose of this scenario exercise is to assess the most important, impactful and interrelated imperatives. This rather than simply to forecast possible future states based on the existing context, so as ultimately to inform MasterCard Foundation's strategy and action plan.

⁸⁰ The education sector is not considered separately as a target sector for employment generation, because it is primarily seen as an enabler of other sectors rather than as a major direct creator of work. Therefore effective skills development resorts in the private-sector imperatives and cuts across the other three sectors.

Assumptions

For the purpose of the scenario modelling exercise, we make the following assumptions:

- **Variable implementation of public imperatives.** Given that the regional payments Bill is reportedly close to finalisation, we assume that payments interoperability will come into effect in the short term. It is therefore excluded as an uncertainty from the scenario, but rather taken as a certainty to come into effect within the next year. We also assume that digital identity will remain an important imperative, but given the substantial infrastructure investment required to implement a national digital ID, we are not making it a prerequisite for the scenarios modelling exercise. Rather, we assume that identity challenges will be overcome in the Digital Economy through identity proxies. The key areas of focus for this parameter are therefore whether or not an effective data governance framework is implemented in the medium term and whether or not digital contracting is permitted.
- **Linkage between digital innovation and youth employment.** In developing the narrative for the way the scenario will unfold, we assume, as per our theory of change set out in Section 2, that improved digital innovation results in greater productivity in sectors across the economy and that improved productivity, in turn, creates opportunities for new entrants (through entrepreneurship) as well as employment growth among existing players. As set out in Section 2, we do note that it is not a one-to-one gain, as digital efficiency can also destroy some jobs; but the assumption is that the net effects are positive. We also assume that the bulk of the jobs that are created will benefit the youths, as they are (a) more likely to be among the entrepreneurs taking advantage of digital innovation and (b) more likely to have the productive digital skills as employees of growing existing businesses.

9.3.1. Scenario 1: Government takes the lead

As the focus of this scenario is on public-sector interventions – enabling digital contracting, supporting innovative entry and data governance – the impact of these interventions will take some years to take effect. These are highly complex issues, particularly data governance, that require substantial coordination between stakeholders at both the national and the regional level towards the development of an agreed set of rules to which all players are held to account.

Limited focus is placed on the private-sector imperatives under this scenario, which means that the digital development of Senegal's value chains continues to take place organically, but remains constrained by a lack of relevant skills. Local players engaging in global trade slowly strengthen linkages with global networks. The establishment of a robust data governance and enabling framework for digital innovation acts as a signal to players – encouraging greater entrance from global innovation.

9.3.2. Scenario 2: Private-sector driven approach

In this scenario, there is a significant focus on supporting private-sector innovation, both local and imported, with the aim of improving the digitalisation of the economy and improving the productivity and efficiency of core sectors. Doing so, in turn, creates more opportunities for more youth entrepreneurs to enter the market and creates the need and

demand for greater employment among established players – especially for digitally skilled employees, who tend primarily to be youths.

The focus of interventions under this scenario is to boost the development of digital innovation and the providers of those in order to yield productivity and employment gains across the economy. This is achieved by incentivising foreign entrants with innovation that would benefit Senegalese sectors to operate in Senegal by supporting domestic players to develop local solutions for local problems and also by supporting the adoption of digital solutions through both direct training and support and indirectly by strengthening targeted vocational skills.

Although causing significant negative impacts on the Senegal economy, COVID-19 has increased the use of digital channels, platforms and engagement. Therefore, the current environment will support this scenario. Furthermore, although this scenario assumes limited traction in the public imperatives, there will nevertheless be some public policy developments that will support this scenario. Notably, the expected mandated interoperability between payment channels is expected to come into effect towards the end of 2021, further boosting activity and the use of digital payments.

The impact is a short-term spike in digital activity that enhances productivity in key sectors. Furthermore, the incubation and network effects arising from the growth in the local ICT sector mean that innovators learn and are inspired by each other, which supports further innovation. Within a couple of years, the impact of training and the targeted approach to vocational skills development begins to bear further fruit, supporting key growth sectors, such as tourism, to attract and retain new global customers.

However, over the medium term, the initial momentum gained from the targeted private-sector support is not maintained. Ongoing private-sector support sustains ongoing growth, but the remaining high regulatory barriers to entry and operation are a major stumbling block that disincentivises foreign entrants. They choose to invest elsewhere, despite the opportunities presented by Senegal. These factors substantially slow the ability of local innovators to get new products and services to the market and continues to result in a high cost of doing business.

9.3.3. Scenario 3: Coordinated public–private approach

In the short-term, the major impact under scenario three is derived from the support provided to new innovation that underpins the digitalisation and productivity of key established economic sectors. Stronger linkages to global markets are also built in those sectors engaging global markets. Given that the focus is split between both public and private imperatives, fewer resources are able to be applied to private-sector imperatives and so the initial growth in scenario three tracks a similar path to that in scenario two, but with a lower initial impact.

Interventions applied to identify and improve the training of key skills also begin to have a substantial impact on the supply of workers with good vocational skills and productive digital skills. This provides a boost to the productivity gains from digitalisation after two to three years.

As digital solutions become increasingly embedded in many sectors, the network effects that naturally arise due to the ability to collect, use and exploit data manifest themselves. However, in parallel, industry has been working with the Government to redesign the governance of data and innovation in order to create a competitive market with a stronger enabling environment. The result is that, as in scenario one, the enhanced governance structures provide a boost to digital innovation. However, unlike scenario one, under scenario three there is already a larger network of innovators in place in Senegal. This combination makes the country highly attractive to new innovators, who see both a flourishing innovative sector and an enabling public sector. Furthermore, the targeted vocational skills training also means that the translation of innovative digital solutions into individual sectors is substantially enhanced.

9.3.4. Sector pathways

How will these scenarios unfold across the focus sectors and what will the estimated productivity and employment gains be for each sector? Annexure 5 develops detailed narratives for the expected development pathway and employment impact for each focus sector across each of the three scenarios. In summary:

Groundnut sector pathway and estimated impact

Scenario 1 sees the Government working to rectify the lack of clearly defined regulation on digital contracting and e-signatures, as well as enforceable consumer data-protection laws, as primary enabling environment hurdles to productivity in the groundnut sector. Even if the reforms will take time, the step towards overcoming these regulatory hurdles will provide a positive signal to value chain participants that will stimulate digitalisation. However, without new entrants or private-sector market development initiatives to overcome challenges around vertical integration and logistics, the groundnut sector, for the most part, will continue on its current growth trajectory.

Under **Scenario 2**, increased investment by the private sector to support digitalisation and entrepreneurship initiatives is expected to boost sector productivity and employment significantly. However, the absence of a complementary enabling regulatory environment under this scenario will limit these gains to the short term and eventually result in a tapering-off effect in the long run.

In **Scenario 3**, the limitations on productivity and efficiency faced by public- and private-sector interventions when delivered in isolation of each other are overcome: in parallel with private-sector initiatives to support investment in digitalised logistics, CNIA coordination, digital marketplaces and PA, BCEAO and the Government work to provide a regulatory and legal environment that fosters digital innovation and market development for long-term sustainable growth. By catalysing private-public-sector intervention, the full potential of digitalisation will be unlocked through enhanced value chain logistics and payment efficiency, the introduction of PA and through greater capital investment attracted by enabling regulation. As a result, the short-term gains observed in Scenario 2 from private-sector investment in digital platforms and entrepreneurship will be replaced by more long-term sustainable investment.

Groundnuts – Estimated Scenario 3 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 95% increase across 10 years
- **Agriculture output-to-employment elasticity:** 0,4
- **Digitally enabled job creation by 2030*:** 1 180 386 additional jobs.
 - Jobs taken or created by youths (65%): 767 251.
 - Jobs taken or created by women (36%): 424 939.
- **Additional jobs created from baseline scenario:** 1 180 386

^x Source: *Job creation for youth in Africa Assessing the potential of industries without smokestacks* (Mbaye, et al., 2019)

* From a base of 3.1 million employed in agriculture in 2020

Textiles and apparel sector pathway and estimated impact

Under Scenario 1, the finalisation of digital payment regulation by the BCEO, the development of digital contracting and identity frameworks to enable digital payments, and regulatory revisions to ameliorate constraints to accessible and affordable cross-border payments, will see the creation of an enabling payment ecosystem that broadens access to local and international markets for Senegalese apparel businesses over the medium term. Even in the short term, proactive communication by BCEAO of these regulatory reforms will provide a much-needed positive signal of change to the Senegalese apparel sector. Yet without private-sector intervention to initiate new market developments, the current growth trajectory for the sector is not expected to change substantially and the decline of the textiles industry is expected to continue. Since no new private-sector initiatives will take place to upskill new entrants to the sector, invest in modern digital infrastructure or facilitate industry collaboration, the extent to which new jobs will be created is limited. Scenario 2 sees the private-sector imperatives realised, but without the enabling environment reforms needed for optimal impact. Private-sector players proactively tackle value chain challenges that impede the willingness and ability of market participants to take full advantage of digital tools and infrastructure in Senegal through investment into digital infrastructure, design and upskilling, in the textiles as well as the apparel industries. Beyond those apparel designers already making use of digital platforms, new entrants and emerging designers who do not currently leverage platforms or website are now incentivised to do so. The private sector is also expected to partner with the Government proactively to support MSME development in the apparel industry, and will support the development of targeted vocational training. Cumulatively, these initiatives lead to productivity and knock-on employment or job-creation opportunities in the apparel industry, even if automation is expected to lead to job losses in the textiles industry.

However, in the absence of necessary public-sector reforms, these gains will be significantly muted. And, although the private sector will succeed in attracting foreign capital investment to support young apparel start-ups in the short term, the lack of an enabling payment ecosystem and regulatory accommodation for e-commerce will limit the willingness of these investors to place their money sustainably in Senegalese industry. Scenario 3 sees an optimal public-private partnership being formed to support

and encourage sustainable gains from digitalisation for the textiles and apparel sector. Under this scenario, BCEAO and the Senegalese Government have taken active steps to foster an enabling payment ecosystem and digital contracting environment, while the private sector has simultaneously intervened to channel investment towards modernising textile production, digitalising designer marketing, sales and distribution, crowding in foreign capital investment, and supporting digital and vocational training where necessary.

The combination of both public- and private-sector interventions to encourage digitalisation sustainably will foster significant productivity gains, as well as employment and job-creation opportunities. Assuming that digitalised payments notably lower SME costs and raise revenue, that digital infrastructure increases the competitiveness of local textiles and that digitalising designer processes through digital tools will enhance value chain coordination, distribution and sales, the sector is expected to benefit from at least a 22% growth in productivity overall with 89 220 additional jobs created, either directly or indirectly, by 2030.

Textiles & Apparel – Estimated Scenario 3 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 22.3 % increase across 10 years
- **Textiles & Apparel output-to-employment elasticity:** 0.6^x
- **Digitally enabled job creation by 2030*:** 89,220 additional jobs.
 - Jobs taken or created by youths (84%): 74,945.
 - Jobs taken or created by women (42%): 37,472.
- **Additional jobs created from baseline scenario:** 78,220 additional jobs

^x Source: *Manufacturing Employment Elasticity and Its Drivers in Developing and Emerging Countries: Focus on Sub-Saharan Africa* (Ali, et al., 2017)

* From a base of 686 thousand employed in the textile and apparel sector in 2020

Tourism sector pathway and estimated impact

The COVID-19 pandemic, which put a renewed spotlight on glaring structural barriers, and a lack of implementation of the vision under the PSE in the tourism sector, are the most pressing challenges that impede the growth of the sector. Under **Scenario 1**, the Senegalese Government focuses, over the short to medium term, on highlighting Senegal as a safe and COVID-compliant travel destination that can offer experiences ranging from beach to desert tourism. By 2030, scenario 1 would mean that progress in the facilitation of cross-border electronic transactions, electronic contracting/signatures and digital identity would have positive effects on the tourism sector, and that strengthened data governance will increase trust in digital services such as online bookings. Targeted vocational training initiatives by the Government to increase digital and customer services skills are also expected to increase productivity and employment in tourism.

Overall, however, the PSE goal of attracting three million visitors a year would not be feasible without corresponding private-sector initiatives.

Under **Scenario 2**, the situation is reversed: private-sector investment and engagement take place, but without corresponding enabling environment improvements. Taking advantage of the momentum that COVID-19 has created in digital transactions, the creation of new and support of existing digital platforms to assist the productivity in the sector will translate into increased bookings and therefore a need for labour. Digital and language skills are built to also target non-Francophone target markets and the application of digital tools to connect value chain actors with each other to solve logistics challenges, facilitate digital payments and link tourism providers to value-added or local services will bring cohesion into the sector and facilitate a gradual formalisation of providers. Closer linkages with international platforms will increase the visibility of Senegalese destinations and make them comparable to competitors to prompt increased pricing competitiveness. The creation of platforms furthermore enables the tailoring of trips to suit all levels of affordability to serve both local and international markets.

Again, however, pure private-sector interventions will not suffice. Over the longer term, structural enabling environment challenges such as the underdevelopment of roads, the lack of a coherent strategy and implementation of policies will hamper the growth in employment, and without public-sector focus and commitment, investor confidence will taper off. In **Scenario 3**, the necessary private- and public-sector initiatives mutually reinforce one another to create a conducive environment for young people to find fulfilling work in the tourism industry. Under this scenario:

- The Government closes the regulatory gaps in data governance, digital payments, digital identity, contracting and e-signatures. This leads to increased trust in the digital environment in Senegal and ultimately an improved business environment. This allows the private sector to effectively establish digital platforms that connect the tourism value chain players with one another, increase the digital visibility of tourism offerings, increase trust in digital payments and ultimately increase the accessible target market, both domestically and abroad.
- Through joint efforts on the education side, digital and employability skills are taught and tourism is promoted as a viable career path for young people. The public sector plays an active role in convening private-sector players, TVET and other education facilities to create tourism-specific vocational training that is not only focused on improving customer service skills but explicitly targets digital skills for the tourism sector.

- The public sector implements its goals and targets set out in the PSE, especially providing the necessary infrastructure investments necessary to supporting sustainable tourism expansion. The Government offers investor incentives in the form of tax breaks, direct investment in road/air infrastructure, and land for the opening of new tourist attractions. The private sector contributes via investment into accommodation facilities and the development of the digital ecosystem around tourist sites, including the platform developments, and the linkages to value-added services such as arts and crafts, local food production, and agriculture. The private sector is also able to communicate effectively with the Government about prioritising activities in the sector.

The combined effect is an estimated 75% increase in sector productivity across ten years, with more than 250,000 additional youth jobs created.

Tourism – Estimated Scenario 3 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 75% increase across 10 years
 - Increased training: 10%
 - Increased digital payments: 10%
 - Increased online presence: 20%
 - Increased integration with international platforms: 20%
 - Increased link-up between value chain actors: 15%
- **Tourism output-to-employment elasticity:** 0.9
- **Digitally enabled job creation by 2030*:** 314,685 additional jobs.
 - Jobs taken or created by youth (56%): 176,223
 - Jobs taken or created by women (83%): 261,188.

^x Job creation for youth in Africa: Assessing the potential of industries without smokestacks (Mbaye, et al., 2019)

* From a base of 422,000 employed in tourism

9.3.5. Employment impact

The estimates across the sector pathways combine to render the following net employment impacts for scenario three:

Breakdown by focus sector/ target group (Scenario 3)	
Agriculture	1,180,386
Textiles	89,220
Tourism	314,685
Total	1,584,291
Youths	1,018,419

Women	723,600
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Table 1. Estimated employment impact for scenario three

Source: Authors' own, based on various input sources and assumptions

The diagram below illustrates the expected aggregate employment impact pathways of the three scenarios across the focus sectors:

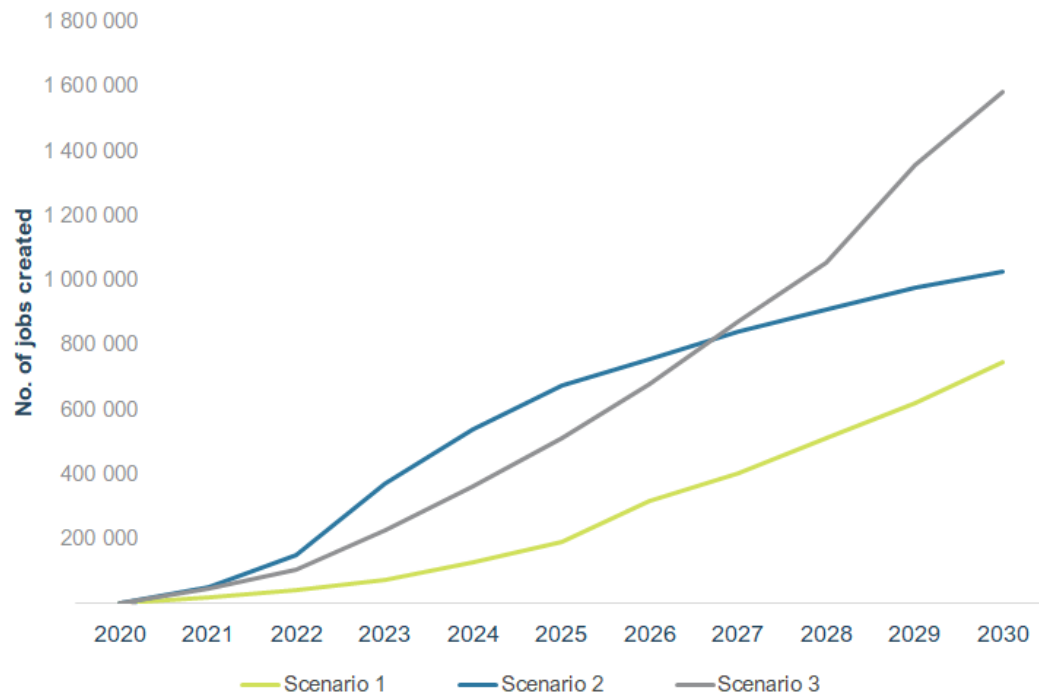


Figure 18. Modelling the employment impact of the scenarios

Source: Authors' own, based on Dalberg macro employment projections (2021)

Across the economy, the projection for the employment impact of scenario one is slow initial growth with a spike towards the end of the period as the public imperatives take effect. The assumption is that market players would anticipate the public policy developments before they are implemented, so there is a positive signalling effect even before governance or regulatory changes. Hence, the effects of scenario two would start to exceed those of scenario one even before regulatory change is fully implemented. Scenario three aggregates the impact to see a steady increase in employment generation.

9.4. Opportunities for the MasterCard Foundation

The analysis has identified a number of targeted interventions that are likely to generate gains from digital innovation across the target sectors. These interventions, as outlined in Sections 5 to 8, and which come together in the imperatives discussed in Section 9.1 and 9.2, can unlock substantial productivity gains in the targeted sectors. Moreover, they can create positive network effects encouraging the further development and productive adoption and application of digital technologies to address challenges, improve resilience and enhance productivity in areas of the economy and population not directly reached through the targeted interventions.

To help realise the key imperatives identified above, this report finds six specific priority opportunities through which MCF can work with either the public or private sector to

employ and embed digital innovation to support the creation of dignified and fulfilling work for the youth.

1. ***Convene key stakeholders towards an industry-led, regulator approved framework for data governance.*** The governance of data collection, storage and use will fundamentally shape the extent to which the development and adoption of innovative digital technologies will manifest in Senegal. The creation of a governance framework that is led by industry rather than regulators is more likely to be adopted and the spirit complied with, than a top-down regulator-led framework. The pervasive nature of data and the challenges in effectively enforcing strict regulation, mean that industry players need to see the benefits and incentives to comply, beyond just formal regulation. Examples from the UK with their open banking guidelines and from South Africa's Financial Sector Charter, provide illustrations of how an industry led approach can be successful in other fields. A key prerequisite in both these examples was a well-informed, objective and neutral convenor. This is a role that MCF could be well positioned to play in Senegal – to first bring the key stakeholders to the table and then follow through and own the continuity of the discussion, bringing in relevant research, experts and stakeholder groups (such as the youth), to ultimately get to a broadly agreed approach to data governance.

2. ***Targeted support for MSMEs in the tourism sector⁸¹ to reach global consumers.*** Increasingly, tourists globally rely on centralised platforms to aggregate the various industry players, easing their ability to make an informed decision. Platforms like Booking.com and Airbnb aggregate the market for travellers seeking guesthouses or short-term rentals. To tap into this global network of travellers, Senegalese providers would need to ensure they are part of these networks. To achieve this requires certain prerequisites, such as the ability to manage online bookings, process cross border payments, communicate in the language of the platform, as well as ensure that their value offering stands out to potential travellers. These platforms also typically rely on consumers' ratings of providers, hence consistent customer service and effective communication is critical to building and maintaining providers' reputations. MCF can provide targeted support to MSMEs in the tourism sector, in partnership with industry associations, to provide:
 - Direct support to MSMEs in establishing an effective online presence for global customers.
 - Training to MSMEs to update websites, platform postings, etc.
 - Training and ongoing guidance on how to effectively market and differentiate service offerings. This can include both effective advertising as well as guidance on how to optimise postings based on understanding platforms' algorithms.
 - A major opportunity for growth lies in greater targeting of non-Francophone customers. Digital translation tools already provide the ability to communicate with non-French speakers, but these can be further supported and adopted.
 - Building awareness amongst industry players, especially in service industries like tourism, of what the global standards for customer service are; and training amongst the youth to build these core skills and grow the employable pool.

81 This study identifies the tourism sector as a cross-border services sector with substantial opportunity for growth and youth employment creation, however, similar support would likely be applicable to other MSMEs engaged in cross-border trade.

- Build the Senegal brand as a tourism destination. Building the Senegal brand has positive reputational effects for all providers in the local industry. Events such as the youth Olympics 2026, that are already set to be hosted by Senegal, could provide a useful springboard.

3. *Support the local digital economy to develop context-specific solutions.*

The development of digital solutions is an obvious prerequisite to the digitalisation of individual sectors and the economy more broadly. Therefore, whilst the growth of the local ICT/ start-up sector will not be a major direct contributor to employment, it is nevertheless a critical sector to support. The digital solutions and innovation developed within this sector will be a major engine for productivity gains, growth and ultimately employment generation across all other sectors. The unique regulatory, infrastructural and cultural context of Senegal (as with any country or society) means that context-specific solutions, or at least unique adaptations to existing solutions, will be required. For example, MyAgro was developed as an alternative solution for farmers to access key inputs, like seeds and fertilizers, in small increments that are otherwise centrally controlled in Senegal and often in short supply. Similarly, the need for translation services into local languages, like Wolof, is specific to Senegal. Supporting local digital innovators relies heavily on creating a supporting and enabling environment, both in terms of enabling regulation but also proactive engagement, support and clear communication from supervisors and policymakers. Beyond creating a strong public enabling environment, innovators also face a number of key prerequisites to success, including:

- Access to capital is the most common constraint identified by entrepreneurs globally and in Senegal almost 40% of entrepreneurs consider lack access to finance as the main factor limiting their growth (World Bank, 2014). Stakeholder Consultations (2021) further emphasise that Senegalese entrepreneurs are largely unable to access sources of funding outside of Francophone countries because of the language barrier.
- Training and mentoring are further key requirements for early stage innovators that require guidance and upskilling.
- Navigating regulatory requirements, particularly in heavily regulated industries, like the financial sector.

MCF can partner with tech hubs and accelerators to support entrepreneurs in the digital economy to overcome these key challenges by supporting training and mentoring initiatives, supporting the provision of legal advice services to entrepreneurs and providing translation supporting services to entrepreneurs navigating language barriers. Furthermore, MCF's global reach and credibility can be leveraged to help highlight promising local development to global providers of capital, particularly in the developed, anglophone world, for whom Senegal's innovators remain largely invisible.

4. *Direct support to the logistics ecosystem to encourage the scaling of improved, technology-driven solutions.* The study identified logistics as a sector critical to the growth of numerous other sectors in the economy. The increasing digitalisation of the economy has only increased the critical importance of an efficient and reliable logistics sector globally. In many agricultural value chains, improved logistics can also substantially reduce losses from spoilage. Emerging logistics platforms, like Yobante

express (see Section 6.2.1), offer real opportunities to improve the efficiency and reliability of domestic logistics and can effectively aggregate and coordinate existing formal and informal transport networks. However, further growth of these platforms will require enhanced access to and use of financial services and risk management tools. Scaling these platforms and developing the sector can be understood along two distinct parameters:

- *Breadth of the logistics network.* To further scale these solutions requires a larger network of freight transport vehicles. It seems clear from the Youth Insights (2021) that there is interest from the Senegalese youth in this kind of work, however the primary barrier to entering the market is access to a sufficiently large lump sum of capital to purchase a truck. Banks and other credit providers typically consider the transport and logistics sector as highly risky, with good reason. The result is that many entrepreneurs are unable to enter the sector and those that do enter the sector purchase the trucks they can afford, which tend to be old, second hand and small. Whilst the up-front costs for these vehicles is lower, the running costs are substantially higher and their small size means lower margins. The option also has substantively worse environmental impact. Part of an integrated solution, therefore, lies in improved proactive risk management. Improved risk management solutions, which would include insurance but also tracking and telematics technology that provide real time tracking of driver behaviour, would help to de-risk capital investments and loans, thus improving access to capital for entrepreneurs in the sector.
- *Depth of the logistics network.* Beyond growing the size of the network to transport higher volumes, effective transport networks also require specific types of infrastructure to transport certain goods. In particular, cold chains require a network of reliable refrigerated trucks. Similarly specific trucks are required for the transport of chemicals and other hazardous materials. Reliable cold chains are particularly important for many agricultural products and without them spoilage is high. The cold chain is very underdeveloped and offers a real opportunity for growth in relevant agriculture value chains. For example, many multinational supermarkets in Africa import all their fresh produce from either Europe or South Africa, rather than source it locally because of the unreliability of cold chains. However, the lump sum of capital required for specialised trucks is even larger and therefore a greater challenge, although the returns on investment may also be greater. IoT sensors that monitor the atmospheric conditions within containers offer enhanced risk management and monitoring solutions for these specialised transport services⁸². The solutions are also able to illustrate to buyers (both local and global) that the produce has remained cold and untouched throughout the entire journey, thereby providing supply chain transparency and quality control for buyers.

MCF can therefore work with logistics providers, particularly aggregating platforms, together with financial service providers and technology providers of risk management solutions to develop integrated, holistic solutions that enable the further scaling and improved reliability of the logistics sector.

⁸² Parsyl, for instance, offers insurance cover, backed by Lloyds, for perishable cargo and vaccines with quality monitoring technology embedded into the product. This is done through a tracking device located within the cargo that records the location of the cargo as well as the temperature, light and humidity that the cargo is exposed to. If breaches of these requirements are recorded, the customer is notified of the event and Parsyl can identify where the breach occurred in the supply chain and responsible party.

5. **Targeting of global technology providers with solutions appropriate for Senegal's key growth sectors.** As discussed in Section 9.2, relevant global innovation can also be “imported” into Senegal. MCF can work closely with relevant policymakers to first identify the priority growth sectors and then identify the key challenges facing these sectors and opportunities for digital solutions to enhance productivity, drawing on the diagnostic research in this report. The biggest sphere of opportunity derived from imported innovation identified in this study is that of precision agriculture. Effective adoption by local farmers is undoubtedly a critical consideration, but it does seem clear that technologies that support agricultural productivity in other parts of the world can play a major role in Senegal.

The next step for MCF would be to identify the specific global providers of the most appropriate solutions for the Senegalese context and then, in partnership with the public sector, incentivise these providers to enter Senegal. Direct financial incentives can shift the risk-reward equation for potential entrants, especially when considering alternative territories for expansion. Non-financial support such as regulatory guidance, consumer research or similar can also be considered as tools to de-risk an investment by a potential innovator and hence incentivise market entry.

6. **Targeted vocational training for key sectors.** Throughout this report, the importance of the availability of requisite skills to engage in the digital economy has been highlighted. However, given local capacity, resource and teaching constraints, an approach should be highly targeted to achieve the greatest gains. MCF can work closely with both public and private sectors to identify where and what specific skills are (and will be) most in-demand and then support the development of targeted vocational training accordingly. Key elements would include:

- i. **Identifying key growth sectors.** Given the finite resources available to support training initiatives and the explicit objective being to improve youth labour absorption, the starting point is to identify which sectors are likely to have the greatest growth potential and need for skilled or semi-skilled labour.
- ii. **Identifying the specific skills required.** The natural next step is to identify the key skills required to support the growth of these sectors over the medium term. The application of digital technologies implies the need for digital skills. However, it would be important to identify the specific skills required within each sector. Most digitally enabled jobs require workers to use the digital tools relevant for their specific activity. For example, digitally enabled graphic design may be important to support advertising and brand-building in the tourism and apparel sectors, but likely largely irrelevant in agricultural sectors. Furthermore, greater adoption of digital innovation by enterprises across sectors will not require only the development of digital skills. In services sectors, such as tourism, where customer ratings are a common feature of digital platforms, high quality customer service skills will further increase in importance, with a lack thereof creating greater and more immediate reputational risks than in a primarily analogue environment. Training specifically on digital skills has tended to prove relatively ineffective across different countries. Rather, embedding digital skills training as part of core training modules tends to be more effective, such as being required to submit assignments in soft copy via email.
- iii. **Robust certification.** As the Youth Insights research showed, formal qualifications are an important goal for many Senegalese youth. A formal certificate, stamp or

similar proof of qualification adds significantly to the credibility and desirability of training and skills development. Furthermore, it is an important signal to potential employers.

- iv. *Blended learning approach.* The shortage of skilled training professionals across Senegal creates challenges to rapidly rolling out targeted vocational training. Online training has developed rapidly over the last decade, further boosted by the global pandemic. Accessing training online allows local young people to access a selection of the best training courses globally. However, pure online learning tends to have high dropout rates and is also highly challenging for participants with limited pre-existing digital skills. A blended approach that draws on the material from online courses but includes offline engagements through mentoring and tutoring relationships, and undertaken with other groups of students, may begin to offer an improved solution.

10. Conclusion

This document set out to consider the scope for the creation of dignified and fulfilling work for young Senegalese through the digitalisation of the economy.

The country context bodes relatively well for digitalisation regarding mobile phone and internet penetration, but a number of foundational regulatory aspects are not yet in place, notably payment interoperability and digital identity that support all digital use cases in the country.

Under the broad definition of a digitalised economy, digital innovation translates into economic impact via activity in the different sectors of an economy. Therefore, the study conducted a deep-dive analysis of the trends, challenges and opportunities for digitalisation in four target sectors: education, groundnuts, textiles and apparel, and tourism. It showed that there is a clear role for digitalisation to enhance the efficacy of inputs and business processes, as well as linkages to markets for enterprises across the focus sectors:

- in the groundnuts sector, aflatoxins mean the PA and improved logistics via digital tools can greatly enhance agricultural output;
- in education, digital or remote learning and vocational training could help to overcome constraints such as the skills-employment gap;
- in apparel, digital market access, and more efficient international payments and logistics can open up new markets; while
- in tourism enhanced service and language skills, and greater online findability and visibility have the scope to aid the recovery of the sector.

On the demand side, the consumer research suggests that the youths have already made the mind shift to entrepreneurial income-generation in the Digital Economy, but they still hold a narrow view of what the Digital Economy entails. They draw largely on social media channels rather than utilising the full potential suite of digital tools to boost their income-earning potential. This calls for a greater role for the public and private sectors to promote the opportunities related to digitalisation beyond social media use.

Unlocking the full impact of digitalisation requires the combination of both public and private innovation support imperatives. It is clear from the scenario modelling exercise that persistent advocacy and market engagement will be needed to reap medium-term gains up to 2030. It is not realistic to expect large quick-wins in employment generation.

Under a scenario where public- and private-sector interventions mutually reinforce one another to reach the optimal employment impact, we estimate that up to 1.58m new dignified employment opportunities could be generated via the Digital Economy, of which the majority would be youth jobs (just more than 1m) and close to half (at an estimated 723,000 jobs) would be female. The Mastercard Foundation could fulfil a key role in advocating a shared public-private agenda to make scenario three a reality.

11. Appendices

Annexure 1: List of stakeholder interviews

	Organisation	Date
	Cross-cutting	
1	ConnectPME	07/04/2021
2	CTIC Senegal	29/03/2021
3	Deloitte	02/04/2021
4	DER	01/04/2021
5	EcoBank	6/04/2021
6	Emeraudia lab	7/04/2021
7	GSMA	16/03/2021
8	GSMA	26/03/2021
9	ICCO-Stars	02/04/2021
10	KaiKai	15/03/2021
11	MaTontine	19/04/2021
12	MCF	26/03/2021
13	Mlouma	06/04/2021
14	OPTIC	08/04/2021
15	Orange Fab	11/03/2021
16	Wave (Former employee)	16/04/2021
17	Acorn Consulting	08/04/2021
18	UNCDF	22/04/2021
	Education	
19	World Bank	26/03/2021
20	UNESCO	06/04/2021
21	Virtual University of Senegal	07/04/2021
22	Gaston Berger University	12/04/2021

23	Mjangale	25/03/2021
24	Ministry of Vocational Training, Learning and Handicrafts and Employment	20/04/2021
25	3FPT – Vocational and Technical Training Fund	06/05/2021
Tourism		
26	Bonjour Senegal	08/04/2021
27	AcoSenegal	22/04/2021
28	Sine Saloum Heritage Site	21/04/2021
29	Tourism Promotion Agency	14/04/2021
30	Sunu trip	10/05/2021
Agriculture (Groundnuts)		
31	Yobanté Express	19/03/2021
32	Agriculture specialist	29/03/2021
33	University of Theis	24/03/2021
34	Enabel	15/03/2021
35	CNIA	24/03/2021
36	ISRA	07/04/2021
37	Sooretul	01/04/2021
Manufacturing (Textiles and Apparel)		
38	Agency for Development and Supervision of Small and Medium-sized Enterprises (ADEPME)	13/04/2021
39	Debbo Dakar	28/03/2021
40	Frip ethique	13/04/2021
41	Senfablab	31/03/2021
42	Setsy	15/04/2021
43	Touty Sy	19/04/2021

Table 2: List of stakeholder interviews

Annexure 2: Youth Insights methodology

The Youth Insights section has been informed by both quantitative and qualitative research in Senegal. Oversight and direction was provided by Cenfri and [Frontier Consulting](#) leveraged an in-country team to conduct all the assessments.

Sample respondents included youth between the ages of 16 and 35 and were split by gender but weighted more towards females and equally balanced across focus sectors. Groups and individuals in urban, peri-urban and rural areas were interviewed, including those both educated and partially educated as well as individuals in varying labour force situations. Respondents from Dakar and Kaolack were included in the qualitative research while individuals from regions of Dakar, Thies, Kaolack, Touba and Saint Louis were included in the quantitative study. The rationale behind the geographic distinction between research approaches relates to population size and ensuring the national representativeness of the sample. More specifically, more respondents were sampled from larger cities in Senegal as respondents were likely to have some level of exposure or engagement with digitalisation (GSMA, n.d.; United Nations, 2019). Other considerations included the fact that Kaolack is one of the main processing and trading centres for peanuts, corresponding to the agriculture vertical for this study (Georges, et al., 2016). Touba and Thies are the second and third most populous cities after Dakar and significant religious and industrial hubs, supporting the manufacturing vertical in the research (Les Ateliers, 2012; Kamara, 2016).

Qualitative research

Qualitative research took place through focus group discussions (FGDs) and in-depth individual interviews (IDIs). These interviews were performed in person and in the mother tongue of the youths; they were subsequently translated into English for the benefit of the study. In total, 14 FGDs were conducted and 30 IDIs. Of the 30 IDIs conducted, 15 were prioritised for translation. Detailed breakdowns of the FGDs and transcribed IDIs are given in Table 3:

Type	Scope	Duration	Number	Dakar	Thies	Kaolak
IDI	School-leavers (high school/ tertiary college/ university)	30 min	2	2		
	Job-seekers (high school/tertiary college/ university)	30 min	3	3		
	Employed/self-employed youths	30 min	3	3		
	Key informant interviews with stakeholders, including MCF foundation partners, youth-led entrepreneurs and youth employers in the digital economy and/or key sector verticals	45–60 min	7	7		
	Total		15			
FGD	Youths, women, community groups		6	4		2
	MSME		6	4		2
	SHF (peanut and cotton)		2	2		
	Total		14			

Table 3: Qualitative research sample description.

The key informant stakeholders include (with names left anonymised to protect identities):

Institution/Company/Sector	Type
Micromed/Baobab	MCF partner
Agriculture Enterprise Development Program – PRODEC	MCF partner
Alush	Entrepreneur (female)
Education	Stakeholder (female)
Tourism	Youth employer (female)
Agriculture	Youth employer (male)

Table 4: Stakeholders for youth insights research

Quantitative research

Data collection was facilitated through a survey, conducted both in person and telephonically. In total, 380 individuals were surveyed, 300 being youths and the remaining 80 comprising youth-led entrepreneurs, youth employers and stakeholders in youth, digitalisation as well as key sector verticals. Data collection was conducted in person and covered multiple regions, where the fieldwork teams adhered strictly to MCF Covid-19 protocols.

The data collected was analysed using descriptive techniques. All quantitative observations were recorded in an Excel spreadsheet and subsequently tabulated and aggregated based on respondent characteristics - gender, region, age, employment status - and the variable of interest. These data points were coupled with qualitative insights to support a comprehensive understanding of the key trends shown in the data.

Area	Youth			Entrepreneur	Employer	Stakeholders	
	School-leavers	Job-seekers	Employed	Youth-led	Youth-focused	Tech/youth/digital	Key sectors
Dakar	47	47	47	7	7	11	11
Thies	14	14	14	2	2	4	4
Kaolak	7	7	7	1	1	2	2
Touba	23	23	23	3	3	6	6
Saint Louis	9	9	9	2	2	2	2
TOTAL	100	100	100	15	15	25	25

Table 5: Quantitative research sample description

An in-depth view of households sampled reveals a fair representation of household income distribution. This was derived from an analysis of good white ownership⁸³, which encompasses household goods such as air conditioners and televisions in order to ascertain the household income bracket. The white goods that were used for this analysis are captured in Table 6. Most households sampled were connected to electricity and running water, 95% of households had access to a cell phone, 39% of households had a laptop or computer, 44% had a CANAL or DSTV subscription and only 26% had internet or Wi-Fi available at home. As such, 60% of households sampled were classified as average to low income, 31% as middle income and 9% as upper income.

⁸³ Income distribution was estimated through an analysis and comparison of good white ownership across households. White good ownership functions as a proxy for household, defined in terms of asset ownership. This proxy is applied to avoid bias from asking numeric questions about income, education, and ownership.

White Good Ownership	%	Household classification	%
Electricity in the house	95%	Upper-income households	9
Cellphone	95%	Middle-income households	31
Television	93%	Average to low-income households	60
Running water in the house	87%		
Radio	81%		
CANAL/DSTV Subscription	44%		
Laptop/Computer	39%		
Internet at home/Wi-Fi	26%		
Air Conditioner	14%		
Other	1%		

Table 6: Description of households sampled

Annexure 3: Examples of support for young entrepreneurs in Senegal

In Senegal, youths aged 15–34 are among the most affected by the labour market conditions, showing the highest unemployment rate at 9%, as well as high inactivity (60%) and underemployment rates (22%) (World Bank, 2018). Entrepreneurship is recognised as a necessary means to survive for youths in Senegal. Unfortunately, much of this takes place in the informal market in a retail environment (Stakeholder consultations, 2021; (World Bank, 2018)). Several initiatives have recognised this problem and have sought to tackle it through financing businesses and training youths. For instance:

Stakeholder	Initiative	Year launched	Activity type	Detail of activity	Impact
Donor: Mastercard Foundation and Education Center for Development	Youth Work-Readiness Programme Project (APTE)	2016	Training	Equipping TVET students with the necessary skills for both employment and entrepreneurship.	Expected to train 1,575 teachers in 210 schools and reach 36,000 young people
Policy facility: <i>La Délégation Générale à l'Entreprenariat Rapide</i> (General Delegation for the Rapid Entrepreneurship of Women and Youth (DER/FJ))	Entrepreneurship Financing	2018	Training and financing	Provides financing that is accessible for entrepreneurial women and youth	To date there have been 106,209 direct beneficiaries from the initiative, with 2,452 formalised businesses registered (<i>Délégation Générale à l'Entreprenariat Rapide</i> , n.d.)
Policy facility: National Agency for the Promotion of Youth Employment/ <i>Agence Nationale Pour La Promotion de L'Emploi des Jeunes</i> (ANPEJ)	Youth Entrepreneurship Fund	2014	Training	Provide funding for youth training. ANPEJ has set up the Guarantee Fund for Youth Entrepreneurship (FOGAREJ) as well as the Youth Entrepreneurship Fund (FEJ)	ANPEJ has been able to enrol 5,124 youths, with 2,377 completing their training.

Table 7: List of ongoing initiatives that support youth entrepreneurship

Annexure 4: What is required for a collaborative approach to forward-looking data governance?

As many regulators globally have done to drive the interoperability of agents and payments channels, regulators and policymakers have a key leading role to play in ensuring that data does not become a barrier to competition. Policymakers can start by convening industry and considering what appropriate data governance should look like. However, to be successful, the approach to data governance needs to be collaborative, including all key stakeholders from the beginning, as they all have a key and complementary role to play:

- **Policymakers** determine the national objectives, guide decisions and decision-making processes, and convene stakeholder groups.
- **Legislature** is responsible for creating and passing legislation.
- **Regulators** have the responsibility to interpret the legislation for their licensed entities and set the specific rules and requirements that entities must comply with.
- **Supervisors** are responsible for monitoring and enforcing the rules and regulations determined by the legislature and regulators.
- **Industry players** are the entities that are primarily responsible for complying with the regulations determined; however, industry can, and does, also set industry norms and practices outside of formal regulation. This is increasingly important in the data governance environment where enforcement is often only feasible with buy-in and cooperation from industry.
- **Civil society** represents the individuals directly affected by the actions of industry players and therefore also the primary stakeholder group that most regulation is intended to support or protect, either directly or indirectly. Civil-society voices, including youth voices, are critical in determining a fit-for-purpose data governance approach and in ensuring that they don't feel disenfranchised by the digitalisation of the economy – as highlighted in section 4.

The United Kingdom's open banking rules may offer a useful example of how this can be achieved – regarding the collaborative process through which the rules were developed as well as the rules themselves that govern the sharing of data between industry players to reduce or eliminate data as a barrier to competition across the industry. But any solutions need to be effectively adapted to Senegal's specific context and environment.

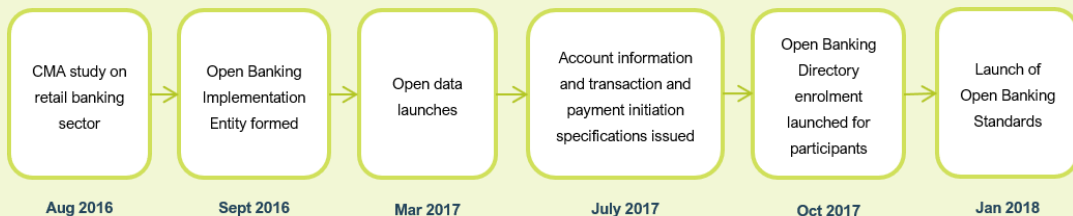
Box 13. Lessons from the UK Open Banking Standards

Background:

When the results of the retail banking study by the UK Competitions and Market Authority highlighted a lack of competition and serious market access barriers for smaller providers as key concerns for the retail banking market, it led to the creation of the Open Banking Implementation Entity. The Open Banking Implementation Entity (OBIE) plays a key role in supporting regulated providers to use the Open Banking standards through designing the API specifications, creating security and messaging standards, producing guidelines for participants, and developing processes for managing disputes and complaints.

The United Kingdom implemented the Open Banking standards, which became applicable on 13 January 2018. This opened the financial services market in the United Kingdom to non-bank fintech providers and third-party providers who would have been traditionally locked out through data-access limitations. Allowing smaller providers access to data enables consumers to have a greater choice between providers and encourages market players to innovate and compete for consumers more fiercely. Innovation benefits as well as greater consumer choice are in fact key aims that the Competition and Market authority had when implementing the Open Banking standards. Open Banking in the United Kingdom has been largely successful, with more than 2 million customers having adopted it and more than 160,000 monthly users by September 2020 (Chatenay, 2020).

Process:



Source: Adapted from Open Banking (n.d.)

Key aspects included in the Open Banking Standards (Open Banking Implementation Entity, 2018):

- To ensure effective risk mitigation against data security risk, it is necessary that large participants and SMME participants adopt the ISO27001 International Information Security standards
- The standards are compliant with the Data Protection Act 2018 and General Data Protection Regulation (EU 2016/679)
- The Open Banking Technical Standards conform to the ISO20022 standards for data structure
- The OBIE is empowered as the central entity that can enrol and revoke participation in the Open Banking Directory
- The OBIE has developed due procedures for disputes and complaints

Annexure 5: Detailed scenario pathways and employment creation modelling for each sector

Groundnuts sector

Scenario 1

Protracted runway to unlock regulatory hurdles in logistics and value chain digitisation with limited growth. A lack of clearly defined regulation on digital contracting and e-signatures, as well as enforceable consumer data-protection laws, are the primary regulatory or public-sector hurdles that impede the overall productivity of the groundnut sector. This means that, in the short to medium term, the focus of the Senegalese Government will be on updating the 08 Law of 25 January 2008 to include a clear and functioning digital signature framework and on implementing the African Union Convention on Cyber Security and Personal Data Protection of 27 June 2014. Although these reforms will take time to be finalised through a series of decrees, a promulgation procedure and regional cooperation, the steps towards overcoming these regulatory hurdles will provide a positive signal to value chain participants and embolden existing digitalisation trends in the agriculture and groundnut market in the meantime.

Continuation of current growth trajectory Knowledge of upcoming regulatory reforms, but without new entrants or private-sector market development initiatives, will see the groundnut sector, for the most part, continue on its current growth trajectory. Holding all things constant,⁸⁴ the value chain will continue to be characterised by highly structured vertical integration that inhibits new entrants in downstream peanut processing but it will also continue to attract new buyers in light of liberalisation reforms. As a result, the demand for groundnut oil will remain on its upward growth trajectory, with China and the United States, among others, as key export markets. However, given that no new private-sector investment is channelled towards the local logistics sector to improve its efficiency and cold chain storage facilities, this scenario will see most peanut farmers continue to have their produce contaminated by Aflatoxin, with access to AflasafeSN01 remaining limited. The persistence of these trends will produce a baseline growth rate of 5% for agriculture (6,4% for agro-processing) and create approximately 55 000 new jobs by 2030 (29 000 for agro-processing). About 46% (84% for agro-processing) and 30% (42% for agro-processing) of these jobs will be taken up by youths and women respectively.⁸⁵

While some aspects of the groundnut value chain will continue on their current growth path, the positive signal relating to regulatory reforms will also strengthen existing digitalisation (rather than catalyse new trends in the absence of private-sector intervention) in the market. This will, in turn, stimulate additional growth and employment in the sector. This effect will take place in two ways:

1. ***Strengthen existing logistics capabilities.*** Progress towards resolving regulatory grey areas around digital contracting and digital identity verification, as well as data governance, will encourage digitally enabled logistics companies such as Yobanté to

84 This assumption implies that the Covid-19 pandemic has not substantially altered current trade patterns, their frequency or demand of consumption. It also assumes that supply value chains will not experience additional rounds of disruption following closed national and international borders in the near to long-term future.

85 Sector growth trajectories and job composition by youths and women serve as the baseline scenario and draw on a forthcoming study by Dalberg (n.d.).

expand. This expansion will allow logistics companies to feel more confident about developing Smart contracts with buyers and suppliers across Senegal, send and receive payment along the value chain via electronic transactions authorised by permissible e-signatures and encourage the acceptance of alternative digital identities as part of driver or vehicle onboarding. This will, in turn, help to de-risk loans to the logistics sector, given greater access by FSPs to more verification and company data (including GPS coordinates from companies with existing tracking capabilities). These loans will contribute towards boosting existing fleet ownership and expand current cold storage facilities. The greater availability of these facilities, coupled with having more tracked vehicles in transit, will improve the efficiency of inputs moved throughout the value chain, enhance the decision-making capabilities of participants, and reduce the likelihood of spoilage (though limited in the absence of greater digitalisation by more logistics companies). Overall, improved logistics will reduce transport and total production costs by at least 10% (Shrader, et al., 2020).

2. **More data collected and shared for PA.** Steps by the Government to protect data, as well as actively promoting its open dissemination, will encourage value chain players such as the CNIA to take more aggressive steps towards data collection and sharing. Efforts by the CNIA will be limited due to the lack of private-sector assistance to boost data-collection abilities. But the coordinating body will be able to collate and share anonymised data from across the value chain to inform smaller players about efficient farming and processing practices through currently used platforms such as WhatsApp and the CNIA website. Armed with more information on farming best practices, seed yield and quality are expected to increase by at least 15%, albeit less than observed between 2014 and 2017, when private-sector irrigation intervention complemented government agriculture programmes (World Bank, 2020).

By 2030, the regulatory process to revise ETC regulation and data governance is expected to be finalised. At this stage, ongoing efforts to digitalise the logistics sector through electronic contracting and digital payments, and advancing PA through data-driven decision-making, will have catalysed knock-on productivity and growth effects. These effects, together with enhanced sector competitiveness and coordination, are estimated to increase groundnut sector productivity by at least 50%.

Groundnuts – Estimated Scenario 1 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 50% increase across 10 years
- **Agriculture output-to-employment elasticity:** 0.4
- **Digitally enabled job creation by 2030*:** 621,256 additional jobs
 - Jobs taken or created by youths (65%): 403,816
 - Jobs taken or created by women (36%): 223,652
- **Additional jobs created from baseline scenario:** 537,256

^x Job creation for youth in Africa Assessing the potential of industries without smokestacks (Mbaye, et al., 2019)

* From a base of 3.1 million employed in agriculture in 2020

Scenario 2:

Investment in digitalising marketplaces, actors and processes sparks immediate but tapered returns. The growth of the groundnut sector remains set according to its current projected trajectory. But increased investment by the private sector to support digitalisation and entrepreneurship initiatives is expected to significantly boost sector productivity and employment. This impact of direct private-sector intervention on the sector is forecast to take place via a number of transmission channels:

- **Direct support to digitalise CNIA communication and sector engagement.** Private-sector intervention will manifest itself in partnership development between CNIA and local ICT firms to upgrade the coordinating body's social media presence and website functionality so as to support real-time alerts to new farming, pricing and processing, deliver timely press release on value chain updates and protocols, and enhance the transparency of capacity-building programmes via CNIA and its members. The website can also offer forums for direct engagement between value chain participants as well as directories that can link farmers, processors and buyers (among other players) to each other and additional cross-cutting services such as logistics companies. Although the effective digitalisation of the CNIA will require its members to upgrade their own digitalisation status, the multiplier effect of digitalising many players in the value chain will help to lower information asymmetries between established and new entrants, foster better linkages between participants and logistics services, and inform more sustainable farming practices via CNIA alerts. More efficient value chain coordination and streamlined processes will increase sector productivity and support job creation by new and established players. The absence of more defined ETC regulation, however, will hamper the extent to which players can conduct business across geographies digitally.
- **Equipping farmers and producers with access to international data banks and collection technology.** International private-sector players will subsidise access, and share data, from global satellites that track climate patterns with farmers and producers to enable more PA. However, because of Senegal's lack of an enabling environment and development of robust data-governance regulation, access to larger databanks from developed countries is likely to be more restricted relative to data from other African or emerging countries. Nevertheless, access to larger sources of data, coupled with privately funded data analytics tools and training for producers, will enhance farmer decision-making and inform smart and more sustainable farming practices. The enhanced availability of credit to fund investments in crop sensors will also enable producers to increase seed yields by at least 20% (Aune, et al., 2017).
- **Enabling the development of digitalised trading and entrepreneurship.** A number of agriculture digital marketplace platforms currently exist in Senegal, including MyAgro, Bayseddo and Sooretul, to name a few. These platforms, however, remain small and limited to only a few services and value chains. With the channelling of additional capital into these applications and supporting the broader incubation of platforms in the agritech space, these applications are expected to grow substantially and acquire sufficient scale to warrant further investment. New entrants seeking to tackle particular frictions in the value chain will also be enabled through incubation programmes and possibly provide greater digital marketplaces for young processors to sell their peanut oil-based products. Such incubation will also equip young start-ups with business training skills to help them leverage the full suite of digital tools that current exist, such as Google Analytics and language translation tools.

- Capital investment into telematic tracking.** Assuming global entrants, such as international insurers and capital investors, are incentivised to enter Senegal, these players will serve to create or partner with existing transportation aggregators to equip them with both vehicle and parcel GSP tracking technology. By investing at scale, more vehicles with tracking technology are expected to have significant multiplier effects throughout the value chain in terms of pricing efficiency, reduce input bottlenecks and inform smart production and processing practices that account for accurate delivery timelines. Furthermore, by equipping fleets with tracking technology and effectively de-risking fleet insurance, insurers and capital investors will be further incentivised to provide or invest in parcel sensors to monitor produce conditions, such as atmospheric and toxin conditions, in cold storage containers. Applied to groundnuts in transit, this technology is expected to enhance the quality of peanuts, increase their demand by European markets, and contribute approximately USD281 million per year to the total value of Senegalese groundnut exports (Gro-Intelligence, 2015).

The combined effects from the above four transmission channels will result in a notable increase in overall groundnut productivity, efficiency and export sales. However, the absence of a complementary enabling regulatory environment under this scenario will limit these gains to the short term and eventually result in a tapering-off effect in the long run. More specifically, without the revision of ETC regulation to account for digital contracting, digital marketplaces will not be able to facilitate sales across borders effectively, logistics firms will not be able to enforce contracts with distant suppliers or consumers, and start-ups will struggle to verify orders on behalf of platform users. In addition, the absence of data-governance regulation will limit farmer access and use to international data banks, and capital investors in emerging agritech may eventually leave Senegal if enabling fintech and payment regulation are not developed. Therefore, although this scenario may entail growth in sector productivity of at least 60%, the majority of these gains will not be sustainable in the long run unless they are paired with necessary regulatory reforms.

Groundnuts – Estimated Scenario 2 productivity and employment gains catalysed by digitalisation:

- Growth in sector productivity:** 60% increase across 10 years
- Agriculture output-to-employment elasticity:** 0.4
- Digitally enabled job creation by 2030*:** 745,507 additional jobs.
 - Jobs taken or created by youths (65%): 484,580
 - Jobs taken or created by women (36%): 223,652
- Additional jobs created from baseline scenario:** 661,507

^x Source: *Job creation for youth in Africa Assessing the potential of industries without smokestacks* (Mbaye, et al., 2019)

* From a base of 3.1 million employed in agriculture in 2020

Scenario 3

Complementary private and public interventions foster sustainable gains. In this scenario, the limitations faced by public- and private-sector interventions on productivity and efficiency when delivered in isolation of each other are overcome by the interventions taking place in tandem. In other words, while the private sector intervenes to support investment in digitalised logistics, CNIA coordination, digital marketplaces and PA, BCEAO and the Government work to provide a regulatory and legal environment that fosters digital innovation and market development for long-term sustainable growth. More specifically, by catalysing private–public-sector intervention, the full potential of digitalisation will be unlocked in Senegal in the following ways:

- **Enhanced value chain logistics and payment efficiency.** BCEAO efforts to establish a digital contracting framework will ensure that digitalised logistics companies can accompany their capacity with new distant buyers and producers. The acceptance of e-signatures will enable payments to be authorised and conducted seamlessly and, together with stronger digital identity verification regulation, investment in the logistics sector will be further de-risked to incentivise capital investment. Furthermore, once a robust data-governance structure is in place and CNIA is equipped to broker digital linkages between transport and value chain players, more data and information will be shared among participants to inform effective decision-making.
- **PA enabled.** By coupling private-sector investment with the provision of data collection tools, training and data bank access, with strong national laws that protect against cybercrime and data manipulation, groundnut producers will have greater access to international data sources that require strict data-protection laws as a prerequisite. By improving the ability of groundnut farmers and processors to learn from international experiences and leverage global data for informed farming methods, producers and processors will be able to improve the environmental sustainability of crops significantly, mitigate natural hazards, produce higher-quality groundnut products and enhance the overall export competitiveness of the sector.
- **Capital investment attracted by enabling regulation?** The short-term gains observed in scenario 2 from private-sector investment in digital platforms and entrepreneurship will be replaced by more long-term sustainable investment as a result of more complete national regulation that enables and attracts innovation. This will primarily occur as a result of legalised digital contracting, improved cross-border payment regulations, the development of a robust data-governance framework and the existence of a developing digital financial ecosystem. These regulatory reforms, together with private-sector intervention to boost the digital capabilities of participants, will in turn attract higher levels of foreign investment and enhanced productivity in the groundnut sector.

Groundnuts – Estimated Scenario 3 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 95% increase across 10 years
- **Agriculture output-to-employment elasticity:** 0.4
- **Digitally enabled job creation by 2030*:** 1,180,386 additional jobs.
 - Jobs taken or created by youths (65%): 767,251
 - Jobs taken or created by women (36%): 424,939
- **Additional jobs created from baseline scenario:** 1,180,386

^x Source: *Job creation for youth in Africa Assessing the potential of industries without smokestacks* (Mbaye, et al., 2019)

* from a base of 3.1 million employed in agriculture in 2020

Textiles and apparel sector

Scenario 1

An enabling payment ecosystem broadens access to local and international markets.

A lack of interoperability between bank and non-bank payment providers and the constrained state of cross-border electronic transactions are key hurdles that limit the growth and trade potential of the apparel sector in Senegal. In the short to medium term, it is expected that digital payment regulation will be finalised by BCEAO and effectively implemented by GIM-UEMOA. In addition, BCEAO will begin to engage actively with Senegal and other member states to develop a clear digital contracting and identity framework to enable digital payments, and also revise regulations to expand the cross-border money transfer licensing regime and ameliorate known constraints to accessible and affordable cross-border payments. Although the adoption of new interoperability regulation will take place in the next year, efforts to revise ETC regulation and the cross-border electronic transaction framework will require a number of years to conclude complex member state consultations and negotiations, finalise decrees, and engage in regulation drafting procedure.

In the short term, developments reflect current sector forecasts. Proactive communication by BCEAO of these regulatory reforms will provide a much-needed positive signal of change to the Senegalese apparel sector. Yet without private-sector intervention to immediately initiate new market developments, the current growth trajectory for the sector remains on course in the short-term in lieu of finalised regulatory reforms. Specifically, the textile component of the value chain will continue to be characterised by the lack of a competitive advantage compared to global textile manufacturers and experience a steady decline in its contribution to GDP and employment as fabric imports exceed exports. In the case of apparel, imported second-hand clothing from the United Kingdom will continue to suffer from disruption due to the impact of Covid-19 on trade, leaving more young women eager to leverage digital tools to develop a local second-hand clothing market. Niche embroidery and couture designers will continue to serve clients primarily through cash, but new interoperability regulations will allow domestic digital payments to be made more conveniently through various channels. This development will incentivise designers to operate on e-commerce platforms such as Jumia and accept/pay using digital wallets as a result of more trust, reliability, and convenience associated with online payments. However,

without private-sector invention to fund or provide training to upskill youths in vocational and digital training so that they can effectively use digital platforms and privately funded digital infrastructure, only a limited proportion of the youths will be able to successfully establish and evolve their informal apparel businesses into formal businesses that can employ more young men and women.

This implies that while established designers will continue to make gains by conducting business as usual – although with greater access to local consumers by facilitating digital payments – there will be limited new employment or job creation opportunities in the apparel sector in the short term. By further considering the jobs that may naturally be lost as the textile sector becomes more uncompetitive and outdated relative to international markets, the baseline average growth rate for the Senegalese textile and apparel sector is 4.2%,⁸⁶ with a contribution to employment of less than 11,000 new jobs by 2030. Approximately 84% and 42% of these jobs will be taken up by youths and women respectively.

Gains from regulatory reforms catalyse sector growth in the long term. It is projected that by 2025–2030 substantial headway will have been made by BCEAO and the Senegalese Government to update and reform the necessary ETC, identity, and cross-border electronic transactions regulation. Although some regulation will still have to be formally promulgated, a number of key steps, bills and guidelines will have been issued to trigger noticeable developments in the apparel sector. The transmission mechanism of these developments will take place in the following ways:

- **Access to local markets widened and value chains digitalised.** The first-round effects of regulatory reform will stem from improved network interoperability and enhanced ETC regulation. By allowing local consumers to pay through a variety of digital payment channels at reduced cost and hassle, the willingness to engage and shop through retail e-commerce sites such as Afrikrea and Jumia will expand. This means that designers already on these platforms will experience heightened revenues as a result, and designers who are yet to move onto these platforms will now be incentivised to adopt them and similarly experience revenue growth (although actual adoption may be impeded by a lack of private-sector assistance to develop digital competencies among non-digitalised designers). Young women eager to sell second-hand clothing via platforms such as Facebook Marketplace will also be able to benefit from easier and more interoperable payments by being able to accept payment from a wider array of digital payment options. Furthermore, with a digital contracting and e-signature framework more clearly defined, local designers (whether on an e-commerce platform or not), will be able to benefit from more efficient contracting with suppliers and buyers across distances and enable logistics firms to cater for domestic deliveries with greater legal certainty.

Coupled with greater access to and use of digital payments, more efficient and digitalised logistics will enable linkages from the textile component of the value chain to apparel designers to be more digitalised and capable of efficiently selling and buying inputs/final garments, as well as distributing them in a timely manner. Digitalised local payments and distribution will in turn enable apparel SMEs to reduce expenses by at least 5% and drive the employment of additional young staff and/or apprentices (Deloitte, 2018).

86 <https://www.ifc.org/wps/wcm/connect/e1527ea2-910e-49f2-8f60-0d484a296688/CPSD-Senegal-v2.pdf?MOD=AJPERES&CVID=ngN-Dig>

- Made in Senegal brand strengthened by enabled cross-border contracting and payments.** A revised and more open cross-border electronic transaction framework will enable young emerging and established apparel designers to sell their garments to a wider array of international markets beyond selected European and WEAMU corridors. This regulation will also imply that designers will be able to accept more digital payments easily via different payment channels of the customer's choice, whether through a bank or non-bank payment provider such as PayPal, and to do so without significant transaction costs borne by either the customer or the designer. Global logistics will also be supported through more formal digital contracting, which should also help to reduce transportation costs by around 1% per growth in per cent sector income (World Bank, 2020c). Additional revisions to digital identity and data-governance frameworks are also expected to increase the level of trust that designers and international customers place in the Senegalese payment system. This will encourage multiplier effects in international demand for the Made in Senegal clothing brand and the subsequent ability of more jobs to be created in the local apparel sector.

A more enabling domestic and international payment ecosystem will allow for notable gains to be made by youths and designers already active in the Senegalese apparel sector. However, since no new private-sector initiatives will take place to upskill new entrants to the sector, invest in modern digital infrastructure or facilitate industry collaboration, the extent to which new jobs will be created is limited. Overall, gains for the apparel sector, as a result of enabled digitalisation, will amount to at least a 9,2% growth in productivity through public-sector intervention alone.

Textiles & Apparel – Estimated Scenario 1 productivity and employment gains catalysed by digitalisation:

- Growth in sector productivity:** 9.2% increase across 10 years
- Textiles & Apparel output-to-employment elasticity:** 0.6
- Digitally enabled job creation by 2030*:** 41,178 additional jobs
 - Jobs taken or created by youths (84%): 34,590
 - Jobs taken or created by women (42%): 17,295
- Additional jobs created from baseline scenario:** 30,178 additional jobs

^x Source: *Manufacturing Employment Elasticity and Its Drivers in Developing and Emerging Countries: Focus on Sub-Saharan Africa* (Ali, et al., 2017)

* From a base of 686 thousand employed in the textile and apparel sector in 2020

Scenario 2:

Traditional players are primed for digitalisation but regulatory environment limits take-off. In this scenario, the private sector plays a key role in tackling value chain challenges that impede the willingness and ability of market participants to take full advantage of digital tools and infrastructure in Senegal. Through direct intervention as well as indirect funding and partnership brokering, the private sector is expected to catalyse productivity gains in the following ways:

- **Investment into digital infrastructure, design and upskilling.** Unlike in scenario 1, the textiles component of the value chain receives notable private-sector investment in the form of upgrading antiquated equipment with new automated digital printing infrastructure, digital devices to enhanced fabric and garment designs, and facilitates the necessary training to make use of these digital tools. While infrastructure and device investment is channelled primarily through existing textile federations, training programmes are privately funded and distributed via government and non-governmental organisations such as Senfablab. Such organisations are expected to reach both formal and informal designers seeking knowledge of how to improve their (digital) textile and apparel design skills. By automating at least part of the textile value chain, the speed and cost at which fabric can be produced is expected to fall and increase labour productivity by at least 2% based on current levels of value addition in the sector (Banga & Willem te Velde, 2018). However, although the private sector will aim to accompany automation with training, direct losses in terms of job destruction will inevitably occur. Without greater involvement by the public sector to provide safety nets for individuals left behind, the net gain of jobs created via enhanced sector productivity may be relatively small.
- **Digital tools leveraged to reach and market towards more digitally enabled consumers.** Beyond those apparel designers already making use of digital platforms, new entrants and emerging designers who do not currently leverage platforms or website are now incentivised to do so following direct assistance from the provide sector to fund and support digitalisation initiatives. In the apparel sector, this takes place via catalyst funds that channel investments towards small designers seeking to develop or enhance the functionality of their existing website/social media presence, including language translation, measurement standardisation features and fabric selections. Training is supported, in addition, through programmes and masterclasses that teach potential and current apparel business owners how to optimally use digital tools such as websites and Google Analytics, how to market to a wider audience, and how to leverage the benefits of existing local and global e-commerce platforms. Direct investment in digitising SME operations, as well as building digital awareness and skills, is expected to increase the demand and customer base of the higher-end apparel sector as a whole, with productivity growth of approximately 3% observed based on current levels of e-commerce activity in Senegal (see Section 7).
- **Fostering an enabling environment for SME development in apparel.** The private sector will play an active role in improving the extent to which potential or micro-businesses in the apparel sector can develop and become employers in their own right. This will involve partnering with government and non-governmental agencies (such as ADEPME and Senfablab, respectively) to digitalise their own presence and to develop business training programmes inclusive of digital skill development, provide tailored mentorship, foster formal and informal sector collaboration by establishing online forums among designers and in-person showrooms, and advocating greater foreign capital investment into established incubators and accelerators by supporting activities such as proof-of-business case research. These types of activity will generate greater skill-sharing and development among businesses and enhance the transparency of available capacity-building initiatives and crowd-in financing to support the growth of the Senegalese high-end apparel brand. As a result of these initiatives, SMEs will be better placed to take advantage of digital opportunities and industry network effects to boost labour productivity and widen potential customer bases.
- **Inform and provide targeted vocational training to possible and new entrants.** In addition to working with existing organisations to deliver necessary digital training, the private sector will also play a role in helping these training centres to develop

accredited certification to those who enrol in training by providing endorsements and linking international training institutes to local providers. The private sector will also play an advocacy role for necessary competencies to be taught in primary and secondary education, such as computer literacy in practical tools such as Gmail and Excel, and to promote fashion design as an avenue for dignified employment or job creation as part of the current curriculum. Holding the current appetite of public schools for this type of intervention constant, such activity by the private sector is expected to stimulate greater interest and productivity of those who choose to enter the apparel space in Senegal.

The cumulative effect of the above private-sector interventions will result in important gains for the apparel sector in terms of productivity and knock-on employment/job creation opportunities. However, in the absence of necessary public sector reforms, these gains will be significantly muted. More specifically, without public-sector safety nets for those affected by job destruction, the net gain in population will be marginal. In addition, a lack of reform in cross-border electronic transfers and poor data governance frameworks will limit the reach and desirability of international customers to engage with designer website or platforms. Young designers may also be dissuaded from using digital tools other than social media if a robust data-governance framework does not foster trust in online opportunities. Furthermore, although the private sector will succeed in attracting foreign capital investment to support young apparel start-ups in the short term, a lack of enabling payment ecosystem and regulatory accommodation for e-commerce will limit the willingness of these investors to sustainably place their money in Senegalese industry. The resultant outcome of private-sector intervention alone will therefore produce productivity gains of approximately only 7% based on current value addition figures in the textile and apparel sector (World Bank, 2020).

Textiles & Apparel – Estimated Scenario 2 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 7,1% increase across 10 years
- **Textiles & Apparel output-to-employment elasticity:** 0,6^x
- **Digitally enabled job creation by 2030*:** 7,452 additional jobs.
 - Jobs taken or created by youths (84%): 23,060.
 - Jobs taken or created by women (42%): 11,530.
- **Additional jobs created from baseline scenario:** 16,452 additional jobs

^x Source: *Manufacturing Employment Elasticity and Its Drivers in Developing and Emerging Countries: Focus on Sub-Saharan Africa* (Ali, et al., 2017)

* from a base of 686 thousand employed in the textile and apparel sector in 2020

Scenario 3

An enabling environment promotes and sustains investment into digitalising apparel. This scenario sees an optimal public–private partnership being formed to support and encourage sustainable gains for the textiles and apparel sector from digitalisation. BCEAO and the Senegalese Government have taken active steps to foster an enabling payment ecosystem and digital contracting environment, while the private

sector has simultaneously intervened to channel investment towards modernising textile production, digitalising designer marketing, sales and distribution, crowding in foreign capital investment, and supporting digital and vocational training where necessary. The combination of these dual interventions will have three particularly important short- and long-term multiplier effects for the sector:

- **Frictionless payment rails encourage e-commerce adoption and sector demand.** Expediting interoperability regulation and creating a more enabling cross-border electronic transaction framework will ensure that designers are able to make and receive payments quickly, efficiently, at reduced cost, and with limited difficulty irrespective of type of digital payment channel or point of geographic origin. For consumers, these regulatory reforms, together with robust data governance laws, will foster a sense of trust, convenience and affordability in relation to e-commerce and stimulate greater engagement with online Senegalese apparel designer websites. Designers and SMEs will benefit from increased consumer sales and reduced transaction costs for sourcing and paying for inputs. As more consumers use platforms and websites to purchase local clothing, and have frictionless positive experiences with these tools, network effects will eventually stimulate a larger domestic and international demand for Senegalese high-end apparel which have also grown in quality as a result of privately funded training. Increased profitability and popularity will encourage the growth of existing SMEs to employ more young staff such as tailors or cutters, as well as encourage youths to establish their own businesses in this field.
- **Regulation attracts capital investment to create sustainable development financing for young start-ups.** Although the private sector will encourage foreign capital investment in the short run, the likelihood of these investments grows significantly in light of observed efforts by BCEAO and the Senegalese Government to enable innovation and cut red tape to support business activity in the country. Furthermore, greater involvement by the regulator and the Government will encourage public-private partnerships to be formed. These will be aimed at ensuring organisations such as SenFabLab and ADEPME are sustainably resourced and/or funded to support the development of SMEs and apparel designers. Combined investment in additional and more inclusive start-up accelerators or incubators will also have the positive effect of stimulating new entrants in apparel and SME growth as future employers of youths and young women.
- **Losers from digitalisation are not left behind.** Private-sector intervention will provide or support training to upskill individuals to use digital infrastructure and devices, while the Government will ensure that those unable to be upskilled are not without a safety net. Combined efforts to provide digital training and welfare support will reduce the loss of livelihoods created by digitalisation and increase the employment net gain in the textiles and apparel sector.

The combination of both public- and private-sector interventions to sustainably encourage digitalisation will foster significant productivity gains, as well as employment and job-creation opportunities. Assuming that digitalised payments notably lower SME costs and raise revenue, that digital infrastructure increases the competitiveness of local textiles, and that digitalising designer processes through digital tools will enhance value chain coordination, distribution and sales, the sector is expected to benefit from at least a 22% growth in productivity overall, with 89,220 additional jobs created, either directly or indirectly, by 2030.

Tourism sector

Scenario 1

Public sector alone unlikely to create major employment boost. At the onset of COVID-19, Senegal had only just recovered from shocks such as the Ebola threat and its tourism industry was on a seemingly positive trajectory due to several public interventions: a new international airport, promising public–private partnerships in the hotel industry with the expansion of new beach resorts and a special focus under the PSE. In 2020, the COVID-19 pandemic put an abrupt end to these gains and caused immense damage to the tourism industry and especially employment. Many development projects were put on hold. The pandemic put a renewed spotlight on the weak public sector in tourism and the heavy reliance on private-sector involvement. Glaring structural barriers and a lack of implementation of the vision under the PSE are the most pressing challenges that impede the growth of the sector. Road and air infrastructure remains inadequate and the Ministry of Transport and Tourism is comparatively weak, with few new ideas and often changing leadership. Moreover, there is a lack of strategic vision and effective collaboration with the private sector, even though the framework is set out well in the PSE. A new tourism Bill is rumoured to be under development, but stakeholders report that they have not been able to read it yet. Therefore, without the heavy involvement of the private sector, the public sector is not likely to achieve major increases in employment beyond organic growth in tourism. However, the new Saint Louis regional airport is still on track to open by the end of 2021. It is aimed at supporting the gas and oil project offshore, which is likely to create jobs in the surrounding areas, especially in business travel hospitality.

Tourism expected to recover from COVID-19 but faces strong competition.

The progress in vaccinations of key target markets, especially in Europe and the United States, holds promise for a renewed joy for travel and adventure as early as the end of 2021 and early 2022. This means that in the short to medium term the focus of the Senegalese Government will be on highlighting Senegal as a safe and COVID-compliant travel destination that can offer experiences ranging from beach to desert tourism. However, the competition for foreign visitors will be fierce and Senegal will face particularly strong competition from the Gambia and Cape Verde, with their similar focus, particularly on beach holidays. Therefore, the Government faces an uphill battle in realising its plans under the PSE of attracting three million visitors a year, and without the development of private-sector initiatives, the growth in employment beyond the recovery of lost jobs during COVID-19 will be modest. If the public sector recognises the opportunity in using the emergence out of the pandemic as a key defining moment in positioning Senegal as a safe and cost-efficient destination, the gains could be larger. However, given the Government's lack of adequate prioritisation in the past, the stakeholder expectations are low.

Regulatory changes will increase foreign exchange and increase sector productivity.

It is projected that by 2030 substantial progress will have been made in the reform of the necessary cross-border electronic transactions regulation, by both the Government and BCEAO. Considerations of a WAEMU-wide digital identity scheme are also under way. These developments would have a positive impact on the tourism sector, specifically with regard to attracting more foreign exchange payments for tourism-related activities through reduced digital payment access barriers. However, these gains cannot be maximised without assisting the players in the sector with their integration in lower-cost payment systems, and devices such as card readers or QR codes, to take full advantage of the

digitalisation of payments. Strengthened data governance will increase trust in digital services such as online bookings, especially if adequate consumer recourse mechanisms are set out and their enforcement is prioritised. Finally, enabling electronic contracting and signatures will improve efficiency in the tourism value chain as different players can contract each other and collaborate more securely. However, given the limited formalisation of the sector currently, it is unlikely that these measures will substantially increase productivity unless accompanied with virtual match-making platforms and marketplaces.

Vocational training increases skills and employment moderately. Targeted vocational training initiatives by the Government to increase the digital and customer services skills in the sector will increase productivity and employment in tourism. However, the lack of private-sector involvement can further contribute to the mismatch between skills and the needs of the industry, and changes to the curriculum are notoriously slow. Therefore, the employment gains from training, if it is purely public-sector led, are moderate.

The box below summarises the calculations of potential job creation under scenario 1, from a baseline of 422,000 jobs in tourism.

Tourism: Estimated Scenario 1 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 25% increase across 10 years
 - Increased training: 5%
 - Increased digital payments: 5%
 - Increased online presence: 5%
 - Increased integration with international platforms: 5%
 - Increased link-up between value chain actors: 5%
- **Tourism output-to-employment elasticity:** 0.9
- **Digitally enabled job creation by 2030*:** 94,950 additional jobs.
 - Jobs taken or created by youths (56%): 53,172
 - Jobs taken or created by women (83%): 78,809

^x Job creation for youth in Africa Assessing the potential of industries without smokestacks (Mbaye, et al., 2019)

* from a base of 422,000 employed in tourism

Scenario 2

Private-sector-led approach has significant potential for employment creation.

Private-sector investment and engagement in the tourism industry has great potential for employment creation through assisting with the digital transformation of the sector in the short to medium term. Taking advantage of the momentum that COVID-19 has created in digital transactions, the creation of new and the support of existing digital platforms to aid productivity in the sector will translate into increased bookings and therefore a need for labour. Digital skills will be needed to create websites for tourism operators, digital marketing, and customer service. Translation services to help reach non-Francophone target markets will create further demand. In addition, the digital tools to connect value

chain actors with one another to solve logistics challenges, facilitate digital payments, and link tourism providers with value-added or local services will bring cohesion to the sector and facilitate a gradual formalisation of providers. Closer linkages with international platforms such as Airbnb and Booking.com as well as international tour operators will increase the visibility of Senegalese destinations and make them comparable with its closest competitors for reactive adjustments to pricing to increase competitiveness. The creation of platforms furthermore enables trips to be tailored to suit all levels of affordability that serve both local and international markets.

Vocational training increases skills and increases quality of offerings. Training and skills development by private-sector entities will increase the pool of skilled labour and ensure that the gap between what the sector needs and what current education can provide is narrowed. This happens through two mechanisms. On the one hand, on-the-job training by hospitality providers together with digital skills training programmes leads to a direct increase in skills and employability. On the other hand, incubation programmes to assist tourism entrepreneurs increase job creation and in turn increase the demand for labour. This increases the quality of the Senegalese hospitality industry and improves competitiveness.

Maximum gains from tourism depend on investor confidence and policy focus. Tourism is not an attractive sector for young people as regards employment or entrepreneurship. Current private-sector players are also not able to absorb a large additional number of employees. The increase in employment will materialise in the longer term only if innovation in the sector is actively supported, encouraged and created in the public sector. The structural issues such as the underdevelopment of roads, the lack of a coherent strategy and implementation of policies, and the lack of maintenance of existing tourist sites, will hamper the growth in employment significantly in the longer term. While investment in digital tools will create some productivity gains, larger private investment in new tourist sites is necessary to develop the ecosystem. Without the adequate public-sector focus and commitment, investor confidence will taper off, especially as other markets become more attractive.

Tourism - Estimated Scenario 2 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 50% increase across 10 years
 - Increased training: 5%
 - Increased digital payments: 10%
 - Increased online presence: 15%
 - Increased integration with international platforms: 10%
 - Increased link-up between value chain actors: 10%
- **Tourism output-to-employment elasticity:** 0.9
- **Digitally enabled job creation by 2030*:** 284,850 additional jobs
 - Jobs taken or created by youths (56%): 159,516
 - Jobs taken or created by women (83%): 236,425

^x Job creation for youth in Africa Assessing the potential of industries without smokestacks (Mbaye, et al., 2019)

* from a base of 422,000 employed in tourism

Scenario 3

In this scenario, the necessary private- and public-sector initiatives to foster tourism in Senegal complement one another to create a conducive environment for young people to find fulfilling work in the tourism industry. The effects of effective public-private partnerships would play out in the following way:

- **Enhanced digitalisation of the sector.** The Government and central bank close the regulatory gaps in data governance, digital payments, digital identity, contracting and e-signatures; this leads to increased trust in the digital environment in Senegal and ultimately an improved business environment. This allows the private sector to effectively establish digital platforms that connect the tourism value chain players with one another, increase the digital visibility of tourism offerings, increase trust in digital payments, and ultimately increase the accessible target market, both domestically and abroad.
- **Increased effectiveness of training.** Through joint efforts on the education side, the public sector ensures that digital and employability skills are taught in schools as early as possible and that tourism is pushed as a viable career path for young people. The public sector plays an active role in convening private-sector players, TVET and other education facilities to create tourism-specific vocational training that is not only focused on improving customer services skills but explicitly targets digital skills for the tourism sector. The private sector effectively puts together training courses for young people focused on ecotourism and solving local challenges through competitions to attract more youths to the sector. It furthermore provides specific support for tourism entrepreneurs through funding, digital marketing and website services, and translation, and assists in the integration with international platforms and operators.
- **Increased investor confidence and expansion of tourism offerings.** The public sector implements its goals and targets set out in the PSE, especially providing the necessary infrastructure investments necessary to support sustainable tourism expansion. This happens through public-private partnerships where government offers investor incentives in the form of tax breaks, direct investment in road/air

infrastructure, and land for the opening of new tourist attractions. The private sector contributes the investment in the accommodation facilities, development of the digital ecosystem around tourist sites, including the platform developments, the linkages to value-added services such as arts and crafts, local food production and agriculture. The private sector is also able to communicate effectively with government about the prioritisation of activities in the sector while government is flexible enough to adjust the prioritisation should further crises occur.

Tourism – Estimated Scenario 3 productivity and employment gains catalysed by digitalisation:

- **Growth in sector productivity:** 75% increase across 10 years
 - Increased training: 10%
 - Increased digital payments: 10%
 - Increased online presence: 20%
 - Increased integration with international platforms: 20%
 - Increased link-up between value chain actors: 15%
- **Tourism output-to-employment elasticity:** 0.9
- **Digitally enabled job creation by 2030*:** 314,685 additional jobs.
 - Jobs taken or created by youths (56%): 176,223
 - Jobs taken or created by women (83%): 261,188

^x Job creation for youth in Africa Assessing the potential of industries without smokestacks (Mbaye, et al., 2019)

* From a base of 422,000 employed in tourism

Annexure 6: Sector Selection Criteria

Selected sector	Specific sub-sectors	Selection criteria
Agriculture	Groundnuts (peanuts)	<ul style="list-style-type: none"> • Groundnuts contribute approximately 60% to agriculture GDP. • According to the World Bank, groundnut activities employ 482,000 Senegalese farmers, with an estimated 1 million people employed directly and indirectly. • Groundnuts accounted for 5% of national export value in 2019, with high growth since 2015 and a positive trade balance. • Shelled groundnuts from Senegal account for 5.3% of world exports for the product, while those in shell contribute 14.4%. • Each unit of value added in groundnut production requires only 0.27–0.50 units of land, labour and other resources. • Opportunities for value-adding in agricultural technology, transport, processing • Opportunities for processing: food products (peanut butter, biscuits, cooking oil); household use (paint, varnish, fuel); agricultural inputs (insecticides, fertilisers, animal feed, nitro-glycerine); beauty (soap, cosmetics); building material (plastics, wallboards, abrasives) and cellulose (rayon, paper) • Scope for digitalisation: technology needed to produce upgraded seeds and manufacture new agricultural machinery; handcrafted trituration techniques needed • Current digital initiatives: Ignitia developed a tropical forecasting model for West Africa; myAgro developed a mobile layaway platform that allows farmers to pay via their mobile phones whenever they have cash available. • 80% of women are employed in food processing in Senegal. • Processing peanuts at the artisanal level will positively affect women's employment. • Historically, women's participation in groundnut crop production was 36.78% (1999), and women were responsible for 37% of all the household groundnut fields in the central groundnut basin in 2002. • In the groundnut basin (a large portion of central and western Senegal, north of Gambia), the youth population represents more than 60% of the total population.

Manufacturing	Textiles	<ul style="list-style-type: none"> • 500,543 jobs in the manufacturing sector (Dalberg) • 93.84% of firms are in the informal sector (Dalberg) • 48.5% of young people (15–35) and 46.4% of women employed in manufacturing (Dalberg) • The Government has high hopes for a special economic zone that it is developing near the new airport just outside of Dakar. • The (PSE) Emerging Senegal Plan aims to turn Senegal into a regional logistical and industrial hub and to develop three integrated industrial platforms, including the textile sector. • Textile industry currently second-most important industrial sector in Senegal • According to the World Bank, 300% of value added in the textiles and clothing sector was added in manufacturing (2015). • Large network of women entrepreneurs (mainly fashion designers) in this area • According to Asepex (2016), most of the industries in the textile sector are SMEs (most producers semi-industrial, producing fewer than 300 pieces per day with fewer than 20 staff members; in 2016 there were only two factories that could produce more than 1,000 units per day)
Tourism and hospitality	<ul style="list-style-type: none"> • Priority sector according to Emerging Senegal Plan (PSE); Accommodation and catering activities are key sub-sectors, with a high potential for job creation, especially for women: • 100,281 jobs in the sector • 97.3% informality rate • 44.2% youth • 85% women (ANSD-ERI-ESI, 2017) • Contribution of 10% of GDP (National Statistics and Demographics Agency of Senegal, 2018) • Low barrier to entry • Initial innovation in marketplaces has happened in the tourism sector like Airbnb or the periphery such as Uber • Scope for e-tourism 	
Education (edtech)	<ul style="list-style-type: none"> • 13.6% of salaried employees (2017) • Edtech is a key strategic priority for the Ministry of National Education (MEN) and features in the 2018–2030 <i>Programme d'Amélioration de la Qualité, de l'Équité et de la Transparence</i> (PAQUET). According to the education sector plan, the Government aims to integrate ICTs to improve equitable access, the quality of teaching and learning, and governance of the sector. • Senegal is in a strong position to expand ICT in education initiatives. • Mobile phone penetration rates are high. • Government is willing to pursue ICTs in education. • Government is developing digital pedagogy and resources for teacher professional development, utilising ICT to support learning at home in response to COVID-19, and prioritising the digitisation of education data (Upadhyay, 2020) • Impact of COVID-19 – digital exclusion • President of Senegal ordered all schools to close on 14 March 2020 • 11% of households have a computer (World Bank, 2016) • 24% of households have internet access at home (ITU, 2018) 	

Table 8: Sector selection criteria

Annexure 7: Expert advisory group

Name	Institution	Role(s)
Jill Shemin		Independent ICT Consultant
Louis Graham	Busara	Engagement Director
Nigham Shahid	GSMA	Employment in Mobile Ecosystems Specialist
Simone Hinrichsen	GSMA	Mobile for Development Insights Manager
Uma Rani	ILO	Digital Platforms' Labour Expert
Papa Mbaye Dieye	EMERAUDIA	Managing Partner & Senegal Fintech Network Affiliate
Rishubh Dhir	ILO	

Table 9: Expert Advisory Group List

Annexure 8: Informed Consent Form

Project Dider

INTRODUCTION

Good morning\ afternoon. My name is _____ from Frontier Consulting, an independent market research company. We conduct various research studies on behalf of our clients. Today we are interested in learning and understanding about the youth of Senegal. We are interested in your experiences and views on different topics.

All the information that you provide is completely confidential and will be used solely for this research. No one, including other participants, will ever learn about your responses. And additionally, I want to be clear that even if you do choose to participate, that you are still free to refuse to answer any of the questions. However, I do want to emphasize the importance of this study and we would greatly appreciate your help and participation.

Your name and contact information will not be given to anyone. This interview is expected to take 10 to 15 minutes.

Are you agreeable that we should proceed?

1) Yes 2. No.

ASK ALL

- Record Gender (**DO NOT ASK**)

Gender	1	2
	MALE	FEMALE

- We are looking for women of a certain age group. Please tell me, how old are you? **INST: IF UNDER 18 SEEK ADDITIONAL CONSENT.**

AGE	CODE	INSTRUCTIONS
Less than 16 years	1	THANK AND CLOSE
16 – 17 years	2	SEEK ADULT CONSENT
18-20 years	3	
21-25 years	4	
26-30 years	5	
31-35 years	6	
36+ years	7	RECRUIT BASED ON STAKEHOLDER NEED
Refused to answer	9	THANK AND CLOSE

- IF ANSWERED “2” in Q2**, Please introduce us to a parent or guardian who can give us a go ahead to continue this interview [This is a MINOR, and to proceed, we need both the consent and presence of an adult]

PARENT / GUARDIAN	
Name	
Age (Actual)	
Contact telephone number	
IF REFUSED: Thank and close	

4. Including yourself, how many people live in your household? _____
5. Including yourself, how many adult, youths and children live in your house? A child is anyone below 13 years, an youth is anyone between 14 – 17 years. An adult is anyone over 18years {tally should equal Q4)

Children	
Youth	
Adults	

6. Kindly tell me, what is your financial role in the household? **READ OUT**

	CODE
Household in largely dependent on you	1
Household is partially dependent on you	2
Household is not financially dependent on you	3

7. What is the highest level of education you have attained so far? **SA**
8. And what is the highest level of education attained so far by the main income earner? **SA**

	RESPONDENT	HH
Illiterate / no formal / school education	1	1
Literate but no formal / school education	2	2
Primary level	3	3
Secondary level	4	4
Post-secondary certificate / diploma	5	5
University undergraduate	6	6
Completed post-graduate	7	7

9. What is your occupation? **MA**
10. And what is the occupation of the main income earner? **MA,**

	RESPONDENT	HH
Full time student	1	1
Part time student	2	2
Employed full time	3	3
Employed part time	4	4
Unemployed	5	5
Run my business / self employed	6	6
Farmer	7	7
Other (specify)		

MEDIA & DIGITAL USAGE

11. Which of the following apply to YOU?

	Daily	2 – 3 times a Week	Weekly	Monthly	NEVER/ DONT
Watch Television					
Read a paper newspaper					
Access the internet / browse google					
Use facebook / Twitter					
Use Instagram / Snapchat					
Use YouTube					
Use WhatsApp					

12. Which of the following apply to you?

	Yes	No	Don't Know
Own a smart phone			
Sell items online / eCommerce			
Have purchase something online			
Listen to music / Watch music online			
Attended a private high school / university			
Have daily access to free WIFI / Internet			

13. Kindly let us know your thoughts on the following topics?

	Agree	Not Sure	Disagree
Senegal is returning back to normal despite COVID 19 effect	1	2	3
Young people have a bright future ahead in this country	1	2	3
Women and youth have numerous opportunities to develop themselves in Senegal	1	2	3
It is easy to start and grow a business in Senegal	1	2	3

14. FGD / IDI Suitability: a. On a scale of 1 to 10 where do you feel sit on the following three spectrums?

I find it easy to put my thoughts into words	1 2 3 4 5 6 7 8 9 10	Although I know what I want to say I often struggle to express what I mean
I find it easy to imagine new ideas and concepts	1 2 3 4 5 6 7 8 9 10	I prefer to deal with reality and the facts. Imagining something that isn't real isn't my strong point
I consider myself to be open minded and receptive to new ideas	1 2 3 4 5 6 7 8 9 10	I'm a bit set in my ways – I've got my own way of doing things and it takes a lot to change me

[All respondents to score 1-4 on at least two of the three spectrums. Please aim for as many as possible to answer close to 1]

INVITATION

I would like to invite you to participate in a discussion group on Youth and their future. If you choose to participate you will be asked to come to a Central Location / or join via Zoom. The group will constitute people similar to yourself and will take about 1 ½ hours.

If you agree to participate, we will cater for your transport for joining us, and also as a show our appreciation.

Will you be available and willing to take part in the research on _____ at _____?

1. Yes 2. No.

Respondent Confidentiality Disclosure

Thank you for agreeing to participate in this Research on behalf of Frontier Consulting. Before you can participate in this research, we would like you to assure you once again that the discussion and responses you provide will be confidential, and that your personal identity will not be used in any way.

It also important that you maintain confidentiality over the responses of others attending the discussion, and commit not to disclose their identity or personal information.

Please confirm you are participating voluntarily without coercion.

By signing this agreement, you will agree as follows:

- You are participating voluntarily and without coercion.
- You will hold in confidence any information discussed and shared in the session - this includes verbal discussions, texts, blogs, twitters or any other medium.

Please confirm your acceptance of these terms by signing and dating this agreement in the space provided below.

I hereby acknowledge and agree to the terms.

By: (signature) _____

Print Full Name: _____

Date: _____

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