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DIGITAL CURRENCIES: IS AFRICA READY?

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ABSTRACT. Digital currencies are likely to modify the way businesses, people and governments transact in Africa. Nonetheless, several factors need to be assessed before the wide adoption of digital currencies in the continent. These factors include the regulatory environment for fintech, the condition of digital infrastructure and the degree of financial inclusion. This paper assesses the readiness of African countries for the issuance of digital currencies. The paper gives an overview of the African countries that have implemented or are considering implementing digital countries. It discusses the issues to be considered for a conducive environment to launch digital currencies. It explores the opportunities and challenges of developing and issuing digital currencies in Africa. The paper finds that although the developed mobile money network infrastructure, high mobile money penetration, the growth of the digital economy and high degrees of financial exclusion position Africa well for the adoption of central bank digital currencies (CBDCs), several challenges need to be addressed. These encompass lower levels of financial inclusion, digital exclusion, the digital divide, poor digital infrastructure and regulatory uncertainty. The paper provides recommendations for improving the prospects of digital currencies in Africa. These include the creation of a legal and regulatory framework for digital currencies, investing in digital infrastructure, improving internet connectivity and educating citizens on digital currencies. Digital currencies can lead to improved economic growth, increase cross border payments, promote financial inclusion and sustainable development

Keywords: Africa, Digital Currencies, Digital Infrastructure, Financial Inclusion, legal, regulatory environment.

JEL Classification: F39

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Introduction

The growth of the digital economy globally has been associated with the expansion of e-commerce activities as well as the widening of the supply of and access to digital financial services (DFS). Fintech has been driving the use of advanced technologies in the provisioning, access, and use of digital financial services. Industry 4.0 in finance has seen the utilisation of the Fourth Industrial Revolution technologies in the financial services industry in both developed and developing countries. Several types of DFS products have been rolled out and these include digital currencies such as bitcoin, mobile money, and Central Bank Digital Currency (CBDC). Ahiabenu (2022) refers to a CBDC as a central bank-offered digital currency that has similar characteristics as cash except for the tangibility feature. CBDCs can be account-based or token-based or interest-bearing instruments. Ozili (2023a) defines a CBDC as a central bank liability with cash-like attributes. Digital currency is money only in this case it is in electronic form (Ozili, 2023b). Digital currency can either be public (eNaira) or private (Ethereum, Bitcoin, Litecoin) based on whether they have been issued by a central bank or a central private entity. Central Banks take full responsibility for issuing and managing the public digital currency. Some of the reasons for the issuance of CBDCs include ensuring an improvement in currency functionality safety of payments, reducing inefficiency in financial systems, and improving the welfare of citizens. Digital currencies could help reduce tax evasion and encourage tax compliance (Ahiabenu, 2022). The objectives of issuing CBDCs are described as the expansion of financial inclusion, improvement of monetary policies, and facilitation of the efficiency of digital payments among other objectives that vary from country to country (Ozili, 2023a). Digital currencies and financial technologies (fintech) can expand financial inclusion in emerging economies (Sapovadia, 2018). Several central banks around the world are researching digital currencies. The interest in digital currencies comes at a time when economies are still recovering from the aftermath of the Covid-19 pandemic, which reduced the projected economic growth of many economies globally (Foster et al., 2021).

African economies are also experiencing the digital transformation that is occurring globally. The countries are exploiting the prospects of digital technologies to facilitate economic inclusion, growth, and development in the financial sector and economy-wide (Madichie & Hinson, 2022). Masela (2021)

asserts that several Sub Saharan African countries' central banks are working towards developing and adopting CBDCs. Digital transformations are also modifying international trade and the operations of the financial sector, the nature of money as well as how people interact with money (Enaifoghe, 2021; Westermeier, 2020). One topical digital transformation in the financial sector is the evolution of money to the issuance of digital currencies (Ozili, 2023c). Africa has not been left out in embracing DFS and this has been evident in some countries launching the CDBCs and some in the advanced stages of implementing the currency while others are proposing. Ozili (2023b) states that the issuance of digital currencies in Africa is slow- paced with 14 countries have exhibited an interest in digital currencies (CBDCs) and 13 having conducted some form of research on the currencies and only four have been at the level of piloting digital currencies. Igoni et al. (2020) attribute the reluctance to adopt digital currencies in Africa to the low acceptance of the currency and the possible risks linked to digital currencies. Nanez Alonso et al. (2021) consider South Africa as the most optimal area for implementing CBDCs in Africa. Ozili (2023b) posits

> "The literature shows that there is a strong case to issue a central bank digital currency in developing countries. For example, it can spur development in areas where paper money has failed to spur development, can increase financial inclusion, it can increase remittance inflows, can increase tax revenue, can improve welfare allocation decisions, can reduce financial crime, and reduce cash-based money laundering, it can eliminate tax evasion when CBDCs are used widely, and it can improve monetary policy functions".

Suggesting a cautious and well-assessed approach to the issuance and adoption of digital currencies, Foster et al. (2021) argue that developing countries might be vulnerable due to weak financial systems. Therefore, the interesting questions are as follows: What factors characterise a conducive environment for the launch of digital currencies? Is the African continent ready for digital currencies? What are the opportunities and challenges connected with the issuance of digital currencies? What could be done to harness the opportunities offered by digital currencies and to ameliorate the negative externalities associated with these currencies in Africa?

Sethaput & Innet (2023) describe CBDCs as an active research area among central banks around the world. Barontini & Holden (2019) affirm many central banks around the world are planning to issue digital currencies. Advocating for more research on digital currencies, Pieters (2021) submits, "Whether a novel tool for monetary policy or supply of a new factor in domestic and global markets, digital currencies present central banks with opportunities

and challenges that are not well understood". By focusing on the African continent, this critical literature review sought to contribute to the theoretical discussion on digital currencies by addressing the questions outlined above. The review sought to provide informative insights into the possibilities, constraints, and implications of digital currency adoption to researchers, policymakers, academics, and developmental bodies.

A Conducive Environment for Launching a Digital Currency

In assessing the suitability of an environment for the issuance of a digital currency, Nanez Alonso et al. (2020) factors such as the development of the financial sector, the digitization of the economy as well the levels of digital literacy must be considered. Pieters (2021) states that when considering the issuance of digital money aspects as privacy and anonymity concerns, decentralisation and centralisation issues, the competition between physical and digital money as well as other legal issues must be taken into analysis. To critically assess the African continent's positioning or readiness to issue or adopt digital currencies, this section reviews the literature on the conditions that are conducive to promoting digital currencies. The section also refers to the success stories of some developed and developed countries in the issue of digital currencies. Several factors influence the productive issue and adoption of a digital currency. Figure 1 gives a summary of some of the factors gleaned from the review of related literature as prerequisites for the successful launch of a digital currency. Success stories and the applicability of the factors will also vary with the contextual environments of the different countries.

From Figure 1 it is evident that several factors generally influence the successful launch of a digital currency. These factors include clear and effective regulations, a conducive regulatory environment, robust technological infrastructure, demand and acceptance of digital currency (Ahiabenu, 2022; Ozili & Nanez Alonso, 2024), a stable economic environment, and government support. Additional factors include public awareness and education, industry collaboration, persuasive value propositions, adequate and effective marketing of the digital currency, the experience and knowledge of those spearheading the launch, a clear road map as well effective partnerships and collaborations with other stakeholders. The technology used to support digital currencies must be modern, current, and continuously evolving, in addition to being efficient, scalable, and secure. The regulatory environment must be consistent, predictable, and clear. Some of the factors are reviewed individually.

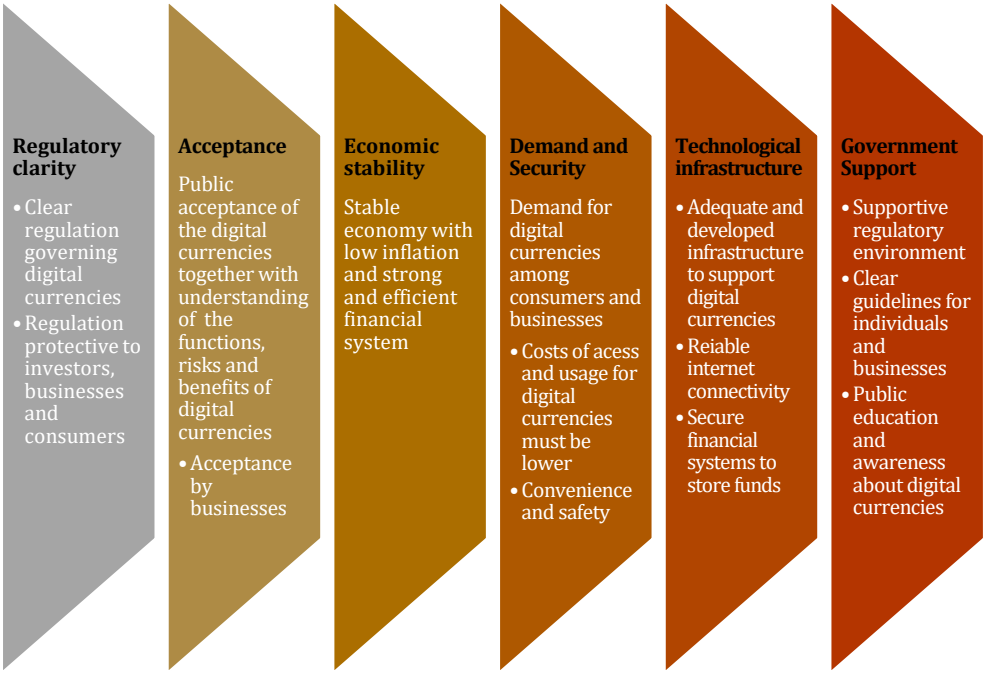

Figure 1: Factors affecting the Issuance and Adoption of Digital Currencies
Source: Author's compilation from different sources
(Nanez Alonso et al., 2020; Pieters, 2021)

- ***Clear roadmap or strategy***

The success of the launch of a digital currency hinges on the design, characteristics, objectives, and implementation of the digital currency. To foster the confidence of businesses, consumers, and investors, the digital currency launch must have a clear road map. The roadmap for the issuance of digital currency can be an intricate process. In coming up with a successful, sustainable, and beneficial roadmap, countries could consider the potential economic impact of the digital currency, the technological infrastructure, the regulatory environment, and the social and environmental impact. This roadmap could differ according to country but a general five-step roadmap is expected to address the digital currency issuance journey. The first stage is the policy development stage. Governments must construct a clear policy framework for the launch of digital currency. The policy must have a clear focus on the purpose or objectives, the target users, the legal and regulatory framework, and the technical infrastructure of the digital currency. The policy development

stage could be done in conjunction with technical development, which could focus on the development of and investment in the requisite technical structure to support the issuance and use of a digital currency. Such technical infrastructure could include blockchain networks, digital wallets, and putting in place security measures. Secondly, the roadmap must address the pilot program stage. This is the stage where the government through the central bank would test the digital currency to identify the potential opportunities and challenges and to assess whether the currency can be issued for wider adoption. The third stage involves public engagement and consultation. Once the piloting stage is completed, public consultations can be done to gather opinions and feedback from various stakeholders such as businesses and the public on their perceptions and experiences concerning the digital currency. This feedback could then be used to improve the digital currency before its ultimate launch to the public. Fourthly, the launch stage. This is the stage at which the currency is presumed to be ready for use after the necessary feedback that is informed by the views from the piloting stage and public consultation. The currency will be launched to the general public. This stage must be accompanied by education and awareness programs to garner support and acceptance for the currency by giving stakeholders enough information on the use, risks and rewards connected to the digital currency. Lastly, the final stage is the monitoring and evaluation. This stage is critical after the issuance of the digital currency, to monitor and evaluate the performance of the currency. This stage is pivotal in the identification of problems, assessing the acceptance and use of the currency, evaluating whether it's achieving its objectives, risk management, and taking corrective action if negative externalities are identified.

- ***Effective partnerships and industry collaboration***

In launching digital currencies, governments must collaborate with businesses and other organisations (Ozili & Nanez Alonso, 2024). Industry collaboration could be exploited to tap into industry experience and expertise as well in developing standards and best practices. Stakeholder consultation and engagement is key throughout all the stages of the process of launching a digital currency. Consultative and collaborative engagements with various stakeholders will increase the transparency of the launch process, create a sense of ownership, bring acceptance, and subject the whole process to evaluative and diverse assessment. All the different types of criticism, both negative and constructive are necessary to increase the adoption and usage of digital currency among informed users.

- ***Compelling or attractive value propositions***

Auer et al. (2021, 2023) point out that the design of digital currency is an important factor in fostering acceptance, demand, and trust. The researchers point to resilience, safety, accessibility, and convenience as key features of a digital currency. To stimulate demand and acceptance, features of digital currencies must be motivating. These characteristics could include low transaction costs, fast and reliable transactions, security of transactions, preservation of privacy, and anonymity among other features. The usability, understandability, and accessibility of digital currencies are fundamental to their wide acceptance and usage.

- ***Effective, transparent, and ethical marketing and outreach***

To ensure long-term success, stimulate trust and acceptance, and generate awareness of digital currencies, the currencies must be marketed aggressively to both consumers and businesses. When users are aware of the currency, its functions, benefits, risks, and limitations (Ozili & Nanez Alonso, 2024), they become more knowledgeable about the currency and can make informed financial decisions as well as take precautions when using the currency. Solberg Söilen & Benhayoun (2021) emphasise the importance of institutional trust as a driver for the acceptance of CBDCs by consumers of financial services. This builds trust and acceptance, which are vital elements of increasing demand for a product, promoting the adoption of and building a community of users for the digital currency in this case.

- ***The experience and knowledge of the team***

To successfully launch a digital currency, the team spearheading the launch must have the requisite knowledge, experience, and technical expertise

- ***Timing of the launch***

The timing of the launch of the digital currency is a critical factor. The launch must be at a time when there is demand for it. The timing of digital currencies must address the costs and benefits as well as the long-term and short-term implications of issuing and using digital currencies (Ahiabenu, 2022). For example, launching the CBDCs towards the election period would just be considered to be a political strategy to gain the support of citizens. This might cause distrust and lack of acceptance by citizens.

By taking into consideration the above factors and their applicability to relevant national contexts, countries exploring the possibility of issuing out digital currencies and those that have launched the currencies could enhance the chances of successfully launching them or increase the acceptance respectively.

Objectives of Launching a Digital Currency

According to Ozili (2023d) a CBDC "is a non-physical or the digital equivalent of physical money issued by a central bank". The design must address the objectives of issuing the currency (CBN, 2021). It can be designed in such a way that it lowers transaction costs (Baker et al., 2023), and interest-bearing, and has increased security characteristics to foster the efficiency of payments or to promote economic stability. Auer et al. (2021, 2022) argue that while CBDCs are receiving more significant attention than previously, different motivations drive different countries and accordingly technical designs and policy orientations towards digital currencies differ. While focusing on Uruguay and South Africa, Kochergin (2021) posits that the consideration of digital currencies was motivated by the desire to control money circulation in the economy. Bilotta & Botti (2021) observe that technological innovations and consumer preferences were driving digital transformations in payment systems and the management of money; hence, CBDCs issuance prospects were gaining momentum. Nanez Alonso et al. (2020) assert that the objectives of issuing digital currencies range from finding secure alternatives to cash to improving monetary policy. Singh et al. (2023) posit that growing interest in CBDCs is driven by the revolutionary transformation of money. The researchers argue that the payment-related objectives were the most dominating objectives for issuing CBDCs. The other secondary objectives are increasing financial inclusion and improving efficiency in payments (Nkomo, 2021). Onumoh et al. (2023), suggest that CBDCs can be issued to reduce inflation, simplify transactions and reduce cash usage, though corruption, internet accessibility, and financial illiteracy can be some of the challenges that can constrain the attainment of the intended objectives. Duho et al. (2022) adduce that the Fourth Industrial Revolution, technological advancements, the need for climate change finance, and economic resilience and recovery are the other reasons for the interest in CBDCs in addition to monetary policy, efficiency, and financial inclusion objectives. Masela (2021) posits that the key considerations towards the attainment of the objectives of launching digital currencies include understanding the likely benefits and risks of CBDCs, building capacity and in-depth understanding of the digital currencies, assessment of the feasibility of their issuance, modernisation of financial services and how to increase control of monetary policy.

From the review of related literature, the objectives of issuing digital currencies differ from country to country, but some converging goals encompass those summarised in Figure 2. Further to the general objectives presented in Figure 2, different countries might have their unique objectives for issuing digital currencies. Examples include India, where the government outlined that the main objective of issuing a digital rupee was to facilitate a cashless economy as well as to ensure a payment system that is secure and safe. In China, the main goal of creating a digital yuan is to enhance the efficiency of payments. Sweden is considering how digital currency could be used to minimise the cost of managing cash. The Central Bank of Nigeria issued the eNaira with the objectives of increasing financial inclusion and promoting economic growth in the country.

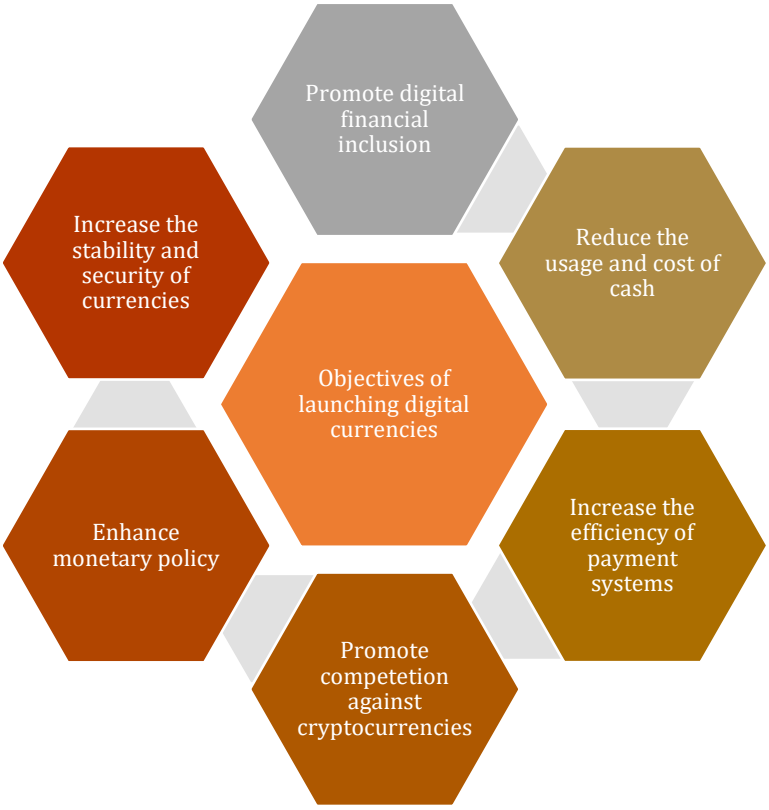

Figure 2: General Objectives of Issuing a Digital Currency
Source: Authors Compilation from different sources such as Ozili (2023b) and Ahiabenu (2022).

- ***Promotion of financial inclusion***

By improving access and affordability of financial services digital currencies can help promote financial inclusion (Kiff et al., 2020; Ozili & Nanez Alonso, 2024), specifically digital financial inclusion of those with no bank accounts. This is attributable to the fact that these currencies can be stored, spent, and transferred electronically, hence eliminating the need for intermediaries such as physical financial institutions. This could be more relevant, especially in developing countries where the levels of financial exclusion are observed to be high.

- ***Reduction of the costs of using and managing cash***

Generally, the cost of printing, storing, and distributing cash is substantial together with the costs of maintaining the security for cash. Therefore, by eliminating the need for cash digital currencies help to minimise the costs of cash handling and management (Bordo, 2021; Mpofu, 2023b). Financial resources that are often dedicated to cash management could be channeled to other areas such as the development and promotion of contemporary financial services and products.

- ***Enhance the efficiency of financial systems***

Digital currencies can be processed electronically and thus eliminating the need for intermediaries. This makes the payment system more secure, cheaper, and faster. Digital currencies could help improve the efficiency of cross-border payments. According to Ahiabenu (2022), most African banks face foreign currency challenges that stifle cross-border trade and payments, hence digital currencies can be explored as a lever to alleviate the foreign currency scarcity problems that affect cross-border transactions. Similarly, Naboulsi & Neubert (2018) contend that BitPesa was introduced to reduce the cost of remittances and fees for international payments.

- ***Increase the stability and security***

The fact that digital currencies such as CBDCs can be issued and managed by central banks can help contribute to their security, transparency, and stability. CBDCs could enhance monetary policy and complement existing financial products and services (Bordo & Levin, 2017; Davoodalhosseini et al.,

2020). Digital currencies could help minimise the occurrences of fraud and theft. Through their ability to leave digital footprints that can be traced and tracked, digital currencies can help in the reduction of financial crimes such as terrorism financing, money laundering, and illicit financial flows among other illegal financial activities.

- ***Enhance monetary policy***

Ward & Rochemont (2019) argue that the development of CBDCs was a response to the emergence of crypto currencies and it has both positive and negative implications for the central government, the financial intermediation role of financial institutions such as banks as well as for monetary policy. Digital currencies could help ameliorate the transmission of monetary policy interventions (Bordo & Levin, 2017; Davoodalhosseini et al., 2020). Relying on the fact that digital currencies are held, transferred, and used electronically, making it easier for central banks to track, monitor and control their circulation, this allows central banks to control the money supply as well the interest rates. This is especially critical for African countries where inflation, illicit financial flows, corruption, and money laundering are some of the biggest challenges to economic stability. Ahiabenu (2022) argues that CBDCs could achieve the objective of promoting citizens' welfare if governed by financially inclusive policy frameworks within the central bank's welfare functions, thereby broadening the bank's traditional role. Policymakers should construct adaptive legal and policy frameworks to deal with the uncertainties connected with the adoption of CBDCs.

- ***Reduce competition from private digital currencies***

Central banks have the role of promoting economic stability, and the sustainability of payment frameworks, regulating the flow of money in the economy, and issuing out currencies. For a long time, central banks enjoyed this monopoly. Fintech and the development of cryptocurrencies such as Bitcoin have unsettled many governments and their central banks. CBDCs have been explored as a way to deal with the growth of cryptocurrencies by introducing a competing currency that people can trust as it is central bank-supported (Ahiabenu, 2022). Digital currencies can also culminate in the development of new financial services and products that include peer-to-peer lending and other microfinance products.

The Launch of Digital Currencies in Africa

Currently, some African countries have implemented or are exploring the implementation of digital currencies. The digital currencies in Africa include the eNaira (Nigeria), the BitPesa, and the Sango Coin (Central African Republic) Nigeria was the first African country to implement a CBDC called the eNaira (Ozili, 2022). This currency is a digital version of the Nigerian naira. The objective was to facilitate a currency that is secure and efficient in making payments. South Africa is currently assessing the possibility of launching a CBDC, with the country's reserve bank assessing the risks and benefits of CBDCs to make an informed decision on the launch or non-launch. Ghana is currently piloting its CBDC, the e-Cedi. The objective is to widen financial inclusion in the country and to facilitate efficiency in making cross-border payments. Table one gives a summary of the African countries. As technology continuously evolves and the business environment continues to be dynamic, coupled with digital transformation and globalisation, African countries will continue to explore and make use of digital currencies in the future.

Table 1: Summary of African Countries Implementing or Exploring Digital Currencies in Africa

Country	**Implemented/ exploring digital currency**
Nigeria	The country launched the eNaira on 1 October 2021. Considered the world 's second CBDC. Adopted by millions of people in Nigeria.
Ghana	Piloting CBDC (e-Cedi) from March 8, 2022, expected to be adopted in 2023
Kenya	Exploring the possibility of launching a CBDC. M-Pesa has driven the country to a cashless country. M-Pesa is used for various financial services such as sending, and receiving money, accessing loans, and paying for insurance, health, and education
South Africa	Exploring the Possibility of Launching a CBDC
Botswana	Exploring the possibility of issuing a CBDC
Ethiopia	Considering the possibility of adopting Bitcoin
Zimbabwe	Exploring the possibility of launching a CBDC
Cote d' Ivoire	Exploring the possibility of issuing a CBDC
Egypt	Considering the possibility of issuing a CBDC
Rwanda	Exploring the possibility of issuing a CBDC
Uganda	Exploring the likelihood of issuing a CBDC
Central African Republic	Adopted Bitcoin as a legal tender in April 2022

Source: Ozili (2023b)

Ozili (2023b) suggests that the issuance of digital currencies in Africa must be accelerated as these could contribute to driving economic inclusion in the continent. The researcher attributes the slow journey toward launching digital currencies to several factors. These factors include the lack of interest in CBDCs by some central banks, preference for cash, low uptake of digital financial services, absence of robust payment frameworks and systems, lack of government support as well as concerns about the risks and security of digital currencies in Africa. Despite these concerns, the continent offers potential for the launch and adoption of digital currencies.

The African continent has a young and expanding population. The continent is observed to have a considerable size of the underbanked and unbanked population. This point to low levels of financial inclusion. Digital currencies could help reduce the financial exclusion gap and promote digital financial inclusion of the underserved and unserved segments of the continent's population. Digital currencies could provide people with an easy, safe, and convenient way to invest, store, transfer, and spend money. The African continent is considered to have high mobile phone penetration rates globally, with more than 60% of the population having mobile phone ownership, signalling a significant potential user base for digital currencies in the continent. E-payments increased in the African continent since 2000, just as they did globally (The Africa Report, 2021). There was an acceleration in e-payments during the COVID-19 pandemic. In 2020, Africa's domestic and cross-border e-payments realised nearly $24 billion in revenues (with $15 billion attributed to domestic electronic payments). In Nigeria, the volume of mobile money transactions was estimated at approximately 800 million in 2020, while in South Africa e-commerce transactions increased by about 40 percent in the years 2020 and 2021. Notwithstanding this, the expansion is likely to differ across the countries, depending on mobile money usage, infrastructure readiness, e-commerce development, and legal frameworks and regulation, in addition to other determinants, in each market (McKinsey, 2022; African Business Information (2023)). Countries such as Kenya, Egypt, Nigeria, Ghana, and South Africa could embrace digital currencies more easily due to the development infrastructure and existing policy frameworks to deliver that support electronic-payments ecosystem.

It could then be deduced that most people in Africa are familiar with the use of digital technology and have a higher probability of embracing digital currencies. Owing to an already well-established mobile telecommunication, infrastructure in most African countries, the costs of setting up and maintaining infrastructure to support digital currencies are anticipated to be low. The mobile money infrastructure could be harnessed and further developed through PPPs to support the adoption of digital currencies. This status quo makes the continent

an ideal market for digital currencies as these offer several benefits when compared to traditional currencies. Government support for development of the digital currencies among African countries is one positive factor that can be exploited to the content's advantage. This avails a supportive regulatory environment that can be enabling for the launch of CBDCs and the adoption of fintech and industry 4.0 technologies in general. Additionally, most African countries are already embracing the Fourth Industrial Revolution technologies such as blockchain, artificial intelligence, the Internet of Things, and Big data among other technologies (Mpofu & Mhlanga, 2022). These technologies could be a foundation for the development and issuance of digital currencies in Africa. Denecker et al. (2023) contend that research should also consider the possible impacts of CBDCs on innovation and the role of commercial banks. Sidorenko et al. (2021) adduce that the legal and economic implications of CBDCs should inform the adoption and non-adoption of CBDC decisions. These arguments need to be critically evaluated to consider both sides of the coin. Even though there are positive factors that could be advantageous to African countries when issuing out or adopting digital currencies, there are some risks that the continent's readiness to deal with them needs to be assessed in-depth. These risks include cybersecurity risks, volatility, and regulatory and operational risks.

Opportunities and Challenges Associated with Digital Currencies in Africa

Acknowledging the possibility of a double-edged sword impact of digital currencies in emerging economies, Edwards (2021), suggests that while CBDCs could lower the costs of international remittances, they could also lead to currency substitution and depreciation as well as to lower seigniorage. The researcher calls for macro-prudential regulations to be implemented for the productive rollout of CBDCs in emerging economies. Masela (2021) adduces that the development of financial technologies avails opportunity that can be harnessed by regulatory authorities and the financial sector to improve the efficiency and operations. Masela (2021) further states that while exploiting these opportunities regulatory authorities must be aware of possible risks linked with the developments and advancements in fintech. It is critical to reconcile the developments in fintech (such as the launch of CBDCs) and attainments of public policy objectives, for example how the new technologies support existing and new business models that are crucial for the achievement of the needs of businesses and consumers who use financial services. The success of CBDCs depends on several factors such as trust, perceived risks, technological

capabilities, skills and competencies, and the assessments of costs such as operational and transactional costs. The assessment of the opportunities and challenges linked to the issuance of digital currencies in the African continent is a complex but important area of research. While African countries generally share similar economic conditions, challenges, and opportunities, some circumstances are unique to certain countries, hence each country would need to carefully evaluate its unique conditions and make a contextual consideration of the risks and rewards. Given these variations in economic, social, and political conditions among countries, Ozili (2022) and, Alberola & Mattei (2022) advocate for well-informed approaches, that incorporate the country or regional-specific environments and factors. Factors that the contextual evaluation should take cognisance of include the level of economic development, the state of the financial system, the degree of technological development and availability and the robustness of the technological infrastructure, the quality of the regulatory environment and frameworks as well the public's awareness and acceptance of digital currencies. Notwithstanding this observation, there are certain opportunities and challenges connected to digital currencies that can be common to African countries. Additionally, factors such as the level of digital and financial literacy as well the political and economic stability of the country as well as the level of the public's trust in the government and digital financial services.

Opportunities Connected to the Issuance of Digital Currencies in Africa

Ozili (2022) suggests that the advantages of using digital currencies include the improvement of monetary policy strategies, increased efficiency and convenience in payments as well as a growth in financial inclusion levels. While acknowledging the opportunities for greater financial inclusion and improvement of efficiency in payments, Alberola & Mattei (2022) point out the African continent could face several problems linked to higher degrees of informality, cross-border spillovers, and cybersecurity risks. Foster et al. (2021) portend that digital currencies in Africa are critical as "a means to promote regional trade and economic integration within countries in the region". This is especially relevant now that the continent is working on the African Continental Free Trade Area (AfCFTA). Concerning the Nigerian e-Naira, Adegbite & Aremu (2022) posits

> "It is concluded that eNaira will have a positive significant effect on the economy in Nigeria in terms of employment generation, economic stability, easy facilitation of transactions, security of money, direct welfare disbursements enablement, Revenue, and tax collection Increment, cost of processing cash reduction, resilient payment system supports, Central Bank currency usability improvement, and economic activities enhancement. It will also serve as a medium of exchange, secured store of value, and a stable unit of account".

Igoni et al. (2020) allude to the likelihood of tax advantages arising due to the use of digital currencies. The possibility in the reduction of tax evasion through the use of digital currency is critical for African countries as they are heavily dependent on tax revenue to fund public expenditure. Domestic revenue mobilisation is weak in these countries due to the presence of a large informal economy that represent a significant portion of the countries' GDP (Sebele-Mpofu & Mususa, 2019). African countries also face the challenge transfer pricing abuse by multinational enterprises (Wealth et al., 2023) and fragile tax administration as well as overgenerous tax incentives (Sebele-Mpofu et al., 2022). Fabian et al. (2022), while focusing on the eNaira in Nigeria, submit that the digital Naira had a significant relationship with the financial performance of listed money deposit banks in Nigeria. In a similar vein, Ekong & Ekong (2022) assert that digital currency adoption was found to be a positive driver of financial inclusion in Nigeria. According to Ekong & Ekong (2022), "cumulatively, the effect of digital finances on financial inclusion in Nigeria was approximately 7% positive". In concurrence, Gopane (2019), concludes that digital access as a proxy for digital currency, had a positive correlation with financial inclusion, but the relationship was negatively affected by digital inequalities. Elderly people benefit less from digital access due to digital vulnerabilities. Esoimeme (2021) observes that the eNaira could foster financial inclusion, strengthen the measures to reduce money laundering and mitigate the financing of terrorism. The researcher further points out that a "poor culture of compliance", employee fraud, and money laundering could be some of the factors that could impede the effectiveness of the eNaira in promoting financial inclusion and combating money laundering and terrorism financing. The different benefits that can be enjoyed from the issuance of digital currencies in Africa include those presented in Figure 3. The summary of the possible benefits foregrounds the discussion of the advantages.

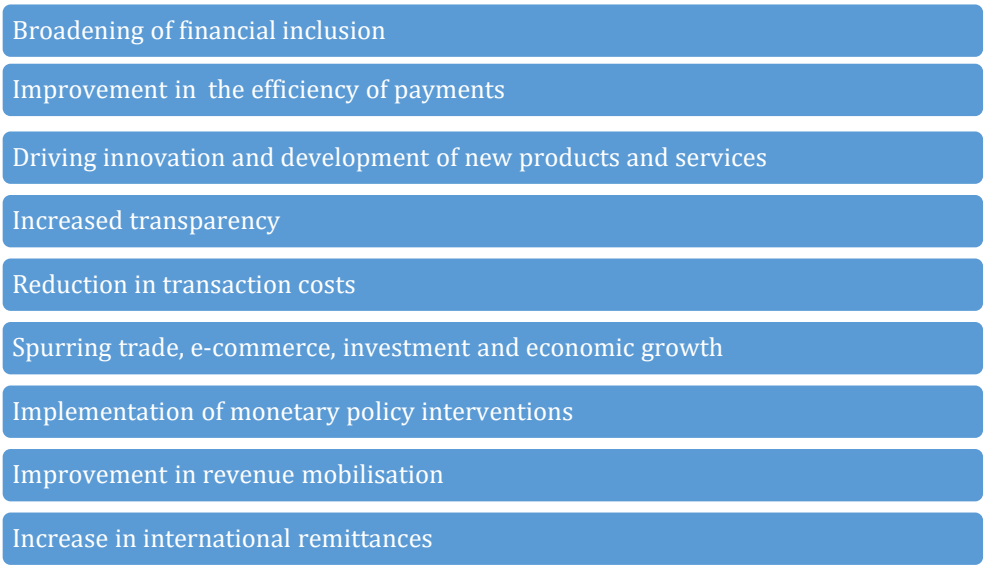

Figure 3: Opportunities associated with the issuance of digital currencies in Africa

Source: Author's Compilation from Ozili & Nanez Alonso (2024) and Kiff et al. (2020)

- ***Widening of financial inclusion***

Digital currencies are likely to increase financial inclusion in Africa, where the levels of financial exclusion are significant. It is also important to note that introducing digital currencies without addressing challenges such as the digital divide, digital infrastructure challenges, gender divide, and unreliable internet connectivity as well as financial literacy challenges might perpetuate the financial exclusion of the vulnerable population. The financially excluded might even face greater social, financial, and digital exclusion. Mpofu (2023b) while focusing on mobile money in Africa portends

> "While the contribution of mobile money services in Africa to financial and social inclusion as well as sustainable development is indisputable, concerns about the objective of wealth maximisation overshadowing the financial and social inclusion efforts is equally persuasive Very little is done to address challenges such as inequalities, infrastructural deficiencies, lack of connectivity and literacy challenges".

Therefore, CBDCs could strengthen the use of digital financial services in Africa, thus indirectly promoting digital financial inclusion which has become critical in the digitally transforming business world. Additionally, while the adoption of CBDCs in Africa is a topic of debate, discussions should also focus on addressing the problems linked to infrastructure, inequalities, gender digital divide and internet connectivity.

- ***Improvement in the efficiency of payment systems***

Digital currencies could help smoothen the payment systems in Africa (Bordo, 2021; Calle & Eidan, 2020). For example, cross-border payments can be made easily and using ways that are safer, quicker, and affordable. The fact that digital currencies are not subjected to regulation is similar to those governing traditional currencies, which are generally cumbersome, expensive, excessive, and time-consuming. The ability of digital currencies to contribute to the reduction of transaction costs and operational costs for consumers and service providers is linked with the broadening of financial inclusion as well as the enhancement of the functioning of the financial system. Basing on the fact that digital currencies can be electronically supplied and accessed contributes to the lowering of transactional and operational costs, making digital currencies easy to access, affordable and convenient. Digital currencies could aid in boosting competition in the financial services industry in Africa by availing more options for people to make transfers and payments. This will not only lower transaction costs but also improve service delivery for customers, broaden financial inclusion, and stimulate economic growth (Kiff et al., 2020; Mpofu & Mhlanga, 2022). Demirgüç-Kunt et al. (2021) emphasise the role played by digital financial services and transactions in promoting financial inclusion and the resilience of payment systems during the COVID-19 pandemic period. It is essential to note that while digital currencies may improve efficiency in financial systems, they could lead to currency substitution. People might choose to use foreign currency as opposed to local currency, thus diminishing the value of local currency. This might make it more challenging for the central bank to control monetary policy.

- ***International remittances***

International remittances are a major source of funds for most African countries (Mpofu, 2023c). For example in countries such as Zimbabwe. Digital currencies can help promote international remittances by facilitating more cost-effective ways of transmitting them.

- ***Increase in trade, investment, and economic growth***

By allowing payments to be made through digital currencies that are faster, cheaper, and more secure. African countries could promote trade and investment and these in turn could drive economic growth (Baker et al., 2023; Kiff et al., 2020; Ozili & Nanez Alonso, 2024). Digital currencies could expand the digital economy, attract investment, promote infrastructural investment and boost economic growth in Africa. Digital currencies could help create new opportunities and businesses. These opportunities could contribute to the empowerment of women and the reduction of inequalities in Africa.

Even though there several positive implications associated with the launch of digital currencies in African countries as outlined in Figure 3, there are also challenges that need to be dealt with in order to create an enabling environment for the issuance and adoption of digital currencies in Africa. Otherwise, the future of digital currencies is marred with uncertainty and controversies in many African countries. Figure 4 presents a synopsis of the general challenges that can be linked to African economies in their quest to issue digital currencies.

- ***Increase in revenue mobillisation***

Digital currencies have the possibility of influencing revenue mobilisation in Africa in several ways. Firstly, digital currencies could enhance tax compliance, which is critical for domestic revenue mobilisation in the continent. The electronic nature of digital currencies and the way they are used could make it simpler for governments to track and trace financial transactions following the digital audit trail; this could help improve tax administration, enforcement, and compliance. The improvement in tax revenue mobilisation is already evident in countries that have introduced taxes on digital financial services. For example in Zimbabwe the Intermediate Monetary Tax on Transactions that is pegged at 2% increased revenue mobilisation. The tax head contributed ZWL 182 775 260 708 in 2022 up from ZWL 45 292 288 567 in 2021. This represents 303.55% nominal growth and real growth of 45.05% (ZIMRA, 2022). Digital currencies could ultimately lead to a reduction in tax evasion by businesses and individuals. Transactions could be recorded on a public blockchain, which makes it difficult to conceal income and profits (Mpofu & Mhlanga, 2022). Digital transactions could also simplify tax audits. Secondly, digital currencies could lead to the creation of new sources of revenue. For example, governments could levy taxes on digital currency transactions or other digital currency-supported financial activities and from the mining of digital currencies. Thirdly, digital currencies could help minimise corruption

associated with the use of cash. This is emphasised by Bordo (2021) who argues that CBDCs could promote the reduction of money laundering, fraud and other financial crimes. In affirmation, Calle & Eidan (2020) posit that CBDCs could increase financial innovation and traceability of transactions. In affirmation Li et al. (2023) describes CBDCs as one of the most fundamentally innovations in the financial sector globally. Therefore, the use of CBDCs would not only increase the transparency of tax officers but that of government officials. The fact that digital currencies are electronically stored and recorded on the public ledger makes their tracking easier and the audit trail visible could discourage corruption and embezzlement of public funds. Fourthly, with the envisaged increase in financial inclusion level in Africa, tax revenue mobilisation could be increased from the benefits of financial inclusion such as reduced poverty, an increase in international trade, improved economic growth, and a rise in international remittances. These activities would stimulate economic growth that could see an increase in the different tax heads such as digital financial services taxes, value added tax, excise taxes, customs duty, corporate tax, and income tax such as pay as you earn. Mpofu (2022a, b) and Pushkareva (2021) described the link between increased revenue mobilisation possibilities and financial inclusion when focusing on mobile money taxes in Africa.

Challenges Associated with the Issuance of Digital Currencies in Africa

Nanez Alonso et al. (2021) describe a CBDC as "an electronic variant of cash issued by a central bank which combines cryptography and digital ledger to offer this digital money". Therefore, challenges could be faced in the use of technological ledgers such as blockchain in the issuance and use of digital currencies. Kochergin (2021) points out that technological and financial changes and challenges as well as high operating costs would make it difficult for countries with underdeveloped financial market structures to support the implementation of digital currencies. Bilotta & Botti (2021) posit that it is important to have a deeper comprehension of the benefits, risks, potential costs, and implications of CBDCs. These could be could cover data privacy, financial inclusion or exclusion, and other macroeconomic consequences. Ozili (2022) asserts that there are risks linked to the issuance of digital currencies in Africa which include, data invasion and theft, an increase in cyberattacks, digital illiteracy, and the changing role of banks.

Nanez Alonso et al. (2020) raise challenges to environmental sustainability linked to digital currencies. The researchers point to the consumption of electricity implications associated with the mining of digital currencies such as

Bitcoin. The problems linked to electricity consumption require due consideration for African countries that are currently experiencing the energy crisis (Mpofu & Mhlanga, 2022) and its implication for green growth and environmental sustainability (Mpofu, 2022b). Duho et al. (2022) observe that while there are positive outcomes associated with CBDCs, there are also possible disruptions and risks that could emerge. These include disruptions in financial systems, negative effects on the use of cash, and unfavourable implications on the role and performance of banking services. Mishra & Prasad (2023) articulate, "Central banks already face threats to their independence and credibility and legitimacy. The more extensive the functionality of money they use, the greater the political pressures they will be exposed to. At a minimum, such innovations pose risks to the integrity of the central bank money". Therefore, while the objective of digitising money by rolling out CBDCs might be an innovation tool that is relevant in a digitally transformed business world, the opposite effect might be true. The result could be a weakening of the very characteristics that make central bank money more credible and trustworthy. Mishra & Prasad (2023) further state that CBDCs can lead to citizens being more inclined to use digital money as opposed to cash. In times of economic distress with only CBDCs money, remaining, increased demand for the money might discourage savings, and money in CBDCs wallets might be considered secure as opposed to bank deposits. This could drive substantial amounts of money into CBDCs wallets putting pressure on central banks and putting limits on CBDCs wallets might be challenging to sustain. Additionally, Mishra & Prasad (2023) observe that CBDCs can be viewed as the government's attempt to solidify its position and have more control over citizens' money. CBDCs could be viewed with political connotations or as a way to increase surveillance and law enforcement. This could breed a lack of trust or increase the existent distrust towards central banks in African countries such as Zimbabwe. While CBDCs could allow the central bank to easily monitor how the currency is used and could hinder the purchase of socially undesirable materials such as drugs, they could be seen as an invasion of people's privacy.

Several challenges associated with the adoption of digital currencies in the African continent collated from the review of literature are presented in Figure 4. Researchers allude to different types of challenges which include lack of scalability (Darbha & Arora, 2020), risk of structural disintermediation of banks, and increased cybersecurity risks and data breaches (Tian et al., 2023).

Figure 4: Summary of general challenges associated with the issuance of digital currencies in Africa
Source: Author's Compilation from Ozili & Nanez Alonso (2024) and Auer et al. (2023).

- ***Risks***

Regulatory risks. The regulatory environment and frameworks governing digital currencies are still uncertain (Ahiabenu, 2022; Ozili & Nanez Alonso, 2024), which could make it challenging for businesses and individuals to confidently adopt digital currencies

Volatility risk. Digital currencies are generally subject to speculation, which can result in their volatility (Ahiabenu, 2022). The value of the digital currency could be fluctuating and this volatility could affect people's savings and earnings if the value declines resulting in financial losses. In this case, people could consider them unreliable and risky for investments or storing value.

Cybersecurity risks. Since digital currencies are stored and transferred through digital networks, they are susceptible to cyberattacks, hacking, and financial fraud, which could lead to financial losses (Kiff et al., 2020; Tian et al.,

2023). Tian et al. (2023) emphasise the possibility of heightened cybersecurity risks due to the launching and use of CBDCs, while Darbha & Arora (2020) allude to the likelihood of the loss of privacy and confidentiality in financial transactions. These risks might have adverse impacts on consumers, financial institutions and the economy at large, hence their adequate assessment is critical.

- ***Regulatory uncertainty***

The absence of a global regulatory framework for digital currencies creates a lot of uncertainty for both developed and developing countries. This also makes African countries reluctant to issue digital currencies that might be difficult to regulate. The status of regulatory frameworks on digital currencies is still hazy, undeveloped, and underdeveloped in most African countries. This could point to the possibility of legal risks that might discourage investors, businesses, and consumers from using digital currencies. About the CBDC regulatory frameworks for the eNaira in Nigeria and the e-Cedi in Ghana, Ahiabenu (2022), adduces "Surprisingly neither country has articulated the detailed legal and regulatory framework for CBDC… Policymakers should focus on the adoption of legal and policy frameworks to address uncertainties associated with CBDC". The lack of clear regulations is a fundamental risk that must be considered as it has both legal and practical implications for CBDCs users and financial institutions.

- ***Lack of digital infrastructure***

Most African countries do not have the requisite robust digital infrastructure to support the issuance of digital currencies (Ozili, 2023b). Such infrastructure includes the necessary software and hardware as well as reliable internet connectivity. The inadequate digital infrastructure is likely to be a constraint for the launch and use of CBDCs in Africa. Limited financial resources also impede investments in infrastructural development projects. These challenges are also compounded by rampant corruption in government projects in most African countries as well as overpricing and non or poor completion of certain infrastructural development projects.

- ***Lack of acceptance***

There is still a lot of uncertainty surrounding digital currencies in Africa. This uncertainty could be linked to the novel and unfamiliar nature of the currencies. It could also be associated with the lack of trust in digital financial services as well the suspicion associated with monetary policy

interventions due to policy inconsistencies (Ozili & Nanez Alonso, 2024). For example, in Zimbabwe Chamboko (2022) explained that citizens have no trust in digital financial services as monetary policies have been inconsistent and unstable and have consequently led to financial losses for citizens. Citizens lost their savings when the country adopted the US dollar and again when the country abandoned the US dollar in favour of the bond note. Therefore, trust in financial institutions is an important factor in encouraging acceptance of new financial products and services such as the CBDCs.

- ***Digital divide and gender disparity***

The digital divide and gender disparity are some of the fundamental factors that influence the readiness of the African continent for the launch of digital currencies (Ozili & Nanez Alonso, 2024). The digital divide or gap describes the gap between those who have access to digital technologies and digital infrastructure and those who do not have access. The digital divide is more pronounced in the African continent with 40% of the population not having access to the internet. In Africa, this gap is evident between urban and rural populations and more visible between men and women. According to the United Nations (UN), in SSA 37% of women are less likely than men to utilise mobile internet (Mpofu, 2023a, d). The African Development Bank established that in SSA only 39% of women had internet access as compared to 56% of men. The digital gender gap has several implications for the adoption of digital currencies in the continent. Women are less likely to be either aware or comfortable to use digital currencies. Women can fail to access our use of digital currencies due to digital constraints such as lack of interconnectivity and other required digital devices. Concerning the digital divide, to use digital currencies people need to have digital devices such as smartphones, in addition to having internet connectivity, otherwise, this cripples their ability to participate in the digital economy or the use of digital currencies. Due to poverty and inequality, most people in African countries cannot afford smartphones and internet data. In most rural areas digital financial exclusion is high, thus increasing the rural-urban digital divide.

Conclusions, limitations and recommendations

While the envisaged opportunities associated with the issuance of digital currencies in Africa are convincing, the concerns for African countries are troubling. The continent-specific challenges such as poorly developed financial systems and markets, limited financial and technical resources, the

possibility of increased cybersecurity risks, digital literacy problems, and weak digital infrastructure pose compelling doubts and questions about the continent's readiness to embrace CBDCs and the African countries' abilities to effectively mitigate the associated risks.

From the literature review, it was established that the issuance of digital currencies is slow-paced but envisaged to gain traction in Africa. It was established that digital currencies could accelerate digital financial inclusion, reduce poverty, promote international trade and investment, stimulate innovation of new financial products and services, and boost economic growth in Africa. Some of the anticipated benefits of digital currencies relate to the strengthening of monetary policies, reduction of cash management costs and risks as well as improving tax revenue mobilisation and international remittances. However, irrespective of these benefits, there are potential risks that African countries have to take into cognisance and carefully evaluate to maximise the potential rewards and minimise the negative externalities. The likely challenges to be surmounted encompass cybersecurity risks, financial instability, digital infrastructure constraints, lack of financial resources, the digital divide, gender inequalities, and perception, acceptance, and awareness problems among other issues. Notwithstanding the possible negative implications and possible constraints associated with the issuance of digital, due to the fast-paced digital transformation of economies worldwide, digital currencies are going to global phenomenon. African countries need to consider possible ways to improve their readiness to adopt digital currencies. In creating a conducive environment for digital currencies, African countries would need to provide a robust and current digital infrastructure, increasing digital infrastructure internet connectivity and mobile phones to rural areas to reduce the rural urban digital divide and to narrow the gender digital divide. Reducing the gender digital disparity by providing digital and financial literacy training would increase women's access to digital technologies and their economic empowerment, thus improving the African continent's readiness for digital currencies, facilitating investment, trade, financial inclusion, and economic growth. Some of the other recommendations to improve the issuance, acceptance and usage challenges connected with digital currencies in Africa are summarised in in Figure 5.

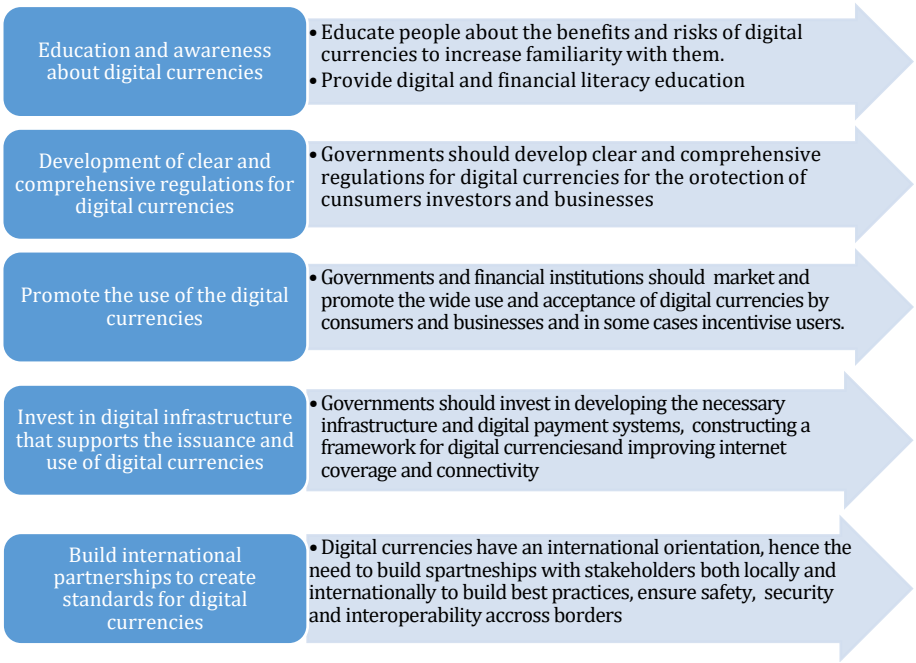

Figure 5: Recommendations to improve the issuance and adoption of digital currencies in Africa
Source: Author's Compilation

As highlighted throughout the paper, digital currencies have potential benefits for the African continent. Their successful launch depends on how the factors that could influence their successful launch which include digital infrastructure availability, the outreach and education programs on the CBDCs, the design of the currency, digital currency regulation, consumer protection and data security measure among other factors. The paper recommends that African countries invest in modern and adequate digital infrastructure, build international partnerships on the launch of CBDCs, develop clear regulations for the governance of digital currencies and to promote education, training and awareness initiatives on CBDCs to improve the readiness of the continents and financial services users to embrace CBDCs.

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