# ACHIEVEMENT OF SUSTAINABLE DEVELOPMENT IN NIGERIA: THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

**By**

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## ABSTRACT

This research looked at the achievement of sustainable development in Nigeria with focus on the role of ICT. The specific objectives are to: show the relevance of ICT towards realizing sustainable development in Nigeria; identify the challenges of utilizing ICT for sustainable development in Nigeria and proffer solutions on how to improve ICT for sustainable development in Nigeria. The theory of technological determinism was utilized as framework for analysis. The documentary method using secondary sources were adopted to gather or collect data, while the qualitative method was used to for analysis. This study revealed that effective utilization of ICT will facilitate sustainable development in Nigeria. This is because ICT has proved to be a catalyst for promotion of good governance, national security, productivity of public sector, educational development, employment opportunities, food security, democracy and facilitation of health services. In addition, it was observed that high cost of ICT services, inadequate infrastructure, issue of power supply, poor ICT literacy and cybersecurity issues are factors that posed challenge to ICT utilization in Nigeria. Therefore, the study suggested for provision of infrastructure, adequate resources or fund, need for adequate spread of ICT and development of adequate security technology etc.

**Keywords: I**nformation and Communication Technology (ICT), Sustainable Development, Technological Determinism

**Introduction**

In this contemporary time, the realization of national and sustainable development cannot be possible without adequate utilization of modern technologies. Man as a tool user adopts several measures and tools to make life easy for him and in this contemporary time, the tools used for day to day activities are the use of technologies or modern gadgets. No individual, group, organization or institution can function effectively and efficiently in this 21st century without a functional and functioning Information and Communication Technology (ICT) (Okafor & Ibekwe, 2021). That is why Eleke, Nwoke and Okude (2014, p. 137) stated that

The development of any nation is usually measured by the degree of socio-economic and political improvements that are brought to bear through the enterprise of science, technology and mathematics, which means that information and communication technology (ICT) has a critical role to play in the development effort round the world.

Information and Communication Technology (ICT) is considered to be a crucial tool for achieving sustainable development goals. ICT includes a variety of technologies such as computers, the Internet, mobile phones, and other electronic devices. These technologies have the potential to promote sustainable development by facilitating communication, enabling access to information, improving resource efficiency, and reducing environmental impacts. According to the United Nations Development Programme (UNDP) (2019) report ICT has the potential to be a "transformative force" in achieving sustainable development which enables access to information and knowledge, promoting innovation and creativity, improving efficiency and productivity, enhancing governance and participation, and facilitating access to markets and services.

The need for Promotion of spread of ICT in Nigeria, made government to formulate Nigeria National Policy for Information Technology in 2001 with objectives to: ensuring IT resources are readily available for promotion of efficient national development; empowerment of Nigeria citizens in participating in software and IT development; improve accessibility to public administration for citizens; ensuring transparency to government processes, develop IT into the mainstream of education and training; enhance national security and law enforcement; develop human capital etc (Nigerian National

Policy for Information Technology, n.d; Oni, Okunoye & Mberika, 2016). This further led to formulation of enabling law of the National Assembly known as the National Information Technology Development Agency Act of 2007, which formally established the National Information Technology Development Agency (NITDA) empowered to plan, develop and promote the use of information technology in Nigeria (Okafor & Ibekwe, 2021). Furthermore, the Nigerian government has made effort to establish the National Broadband Plan, development of e-government initiatives like Integrated Payroll and Personnel Information System (IPPIS), Treasury Single Account (TSA), National Identity Management System (NIMS) etc.

Nigeria has been confronted with the challenge of realizing good governance, ensuring service delivery and quality education. Also, it is faced with the problem of national security, issue of employment, poor health care services etc. These challenges posed a serious hindrance to the achievement of sustainable development. However, these issues can be addressed to an extent if Nigerian government effectively implements e-government policy. Therefore, this paper is set to discuss the relevance of ICT utilization for sustainable development in Nigeria.

**Objectives of the Study**

The broad objective of this paper is to examine ICT and sustainable development in Nigeria. The specific objectives are to:

i. explain the relevance of ICT towards actualizing sustainable development in Nigeria.
ii. identify the challenges of utilizing ICT for sustainable development in Nigeria
iii. proffer solutions on how to improve ICT for sustainable development in Nigeria

**Research Questions**

This study raised the following research questions:

i. What are the relevance of ICT for actualizing sustainable development in Nigeria?
ii. What are the challenges of utilizing ICT for sustainable development in Nigeria?
iii. What are the solutions on how to improve ICT for sustainable development in Nigeria?

**Conceptual Clarification**

**Information and Communication Technology (ICT)**

Information and Communication Technology refers to the use of digital technologies to communicate, create, process, store and manage information. According to the International Telecommunication Union (ITU), ICT includes all technologies used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions (ITU, 2020). Information and Communication Technology (ICT) means the use of several technologies and tools to create, process, store, and exchange information electronically. It involves several devices, software, and communication technologies that enable individuals and organizations to access and share information and communicate with each other. ICT include: Computers, laptops, tablets, and smartphones, Internet etc.

Dutton (2013, p. 4) defines ICT as "the set of tools and resources for communicating, creating, storing, and managing information and knowledge, including the internet, computers, mobile phones, and related technologies". According to Ndalu et al (2022, p11) "ICT refers to "a broad range of technological resources and techniques that are used to create, transfer, store, share and exchange information". To Offiong et al (2021, p. 45) ICT is used as "an umbrella term to refer to the use of communication devices (such as radio cellular devices, satellite devices and channels, computers, amongst others) and utilities (programs) to manage information (acquisition, dissemination, processing, storage and retrieval)".Hanna (1994 as cited in Madueme, 2014) defined information and Communication Technology as "all activities and technologies which involves information acquisition, storage, retrieval, processing, transmission and control." According to Hanna it includes the following:

i. The supply side which deals with the computer hardware and software, telecommunications, equipment and microelectronics; and

ii. The demand side which includes application of information technology to all sectors including financial, manufacturing, education, transaction system, management information systems, electronic publishing and information services (cited in Madueme, 2014).

**Sustainability Development**

The Brundtland Report (1987, p. 8) defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development deals with how to balance economic growth, social progress, and environmental protection to benefits of both current and future generations. It takes into consideration the interconnectedness of different aspects of development. In other words sustainable development involves economic, social, and environmental aspect of development or progress which meets the needs of the present without compromising the ability of future generations to meet their own needs.

**Theoretical Framework**

This paper utilized the technological determinism theory as a framework for analysis. This theory is linked to the study of American sociologist and Economist Thorstein Veblen and later followed by Clarence Ayres, William Ogburn (Technological Determinism, 2023). The technological determinism theory states that the level of technology of any society affects how the society operates. It sees technological advancement as a factor that determines human activity and societal progress. Therefore, social progress is determined by technological innovation. It sees the media technology as a force that shapes how we as individuals in a society think, feel, act, and how society operates (Nosiri & Ndoh, 2018; Chandler, 2014; Adler, 2006). According to Chandler (2014):

Technological determinists interpret technology in general and communication technologies in particular as the basis of society in the past, present and even the future…. Technologies such as writing or print or television or the computer changed society…. New technologies transform society at every level, including institutions, social interaction and individuals.

This shows that for a state or government to progress, it needs a functional modern information technology for delivery of services and realization of national development. The technological determinism is characterized by soft and hard technological determinism. The soft technological determinism viewed that technology is one of the important factors that affect societal progress and human activity while the hard technological determinism argues that technology is the main or the only significant driver affecting society and human activity (Adler, 2006). This theory is based on the

following tenets:

i. Technological development determines social change and progress
iii. Technology has an overwhelming power to drive human interaction and social change.
iv. Social progress is determined by innovation in technology
v. The idea of progress is centralized around the idea that social problems can be solved by technological advancement and which makes society to move forward.
vi. ICT bring transformation shifts in society

The relevance of this theory to this paper is that it will enable us to explain how ICT can play crucial role towards achieving sustainable development in Nigeria. The effective utilization of ICT will guarantee improvement in areas of employment, food security, national security, good governance, public service productivity, democratic consolidation, health services etc in Nigeria. Therefore, the challenge for achievement of development in Nigeria can be associated poor development of ICT.

**Methodology**

This research adopted expository research because it is focused on revealing the relevance of ICT for promotion of sustainable development in Nigeria. Data were collected through secondary sources using journals, textbook, abstract etc. The analysis was done with qualitative analysis with the use of thematic analysis.

**Relevance of ICT for Sustainable Development in Nigeria**

The roles ICT can play in realizing sustainable development in Nigeria include:

1. Good Governance: Effective application of ICT is necessary for realization of good governance in a state. ICT ensures accountability and transparency in governance, effective and efficient service delivery, promotion of citizens' participation and reduction of corruption (Nosiri & Ndoh, 2018; Ekwonna & Nosiri, 2015; Nwabueze & Ozioko, 2011).

   In terms of service delivery, ICT helps in the provision of e-governance services. ICT enables citizens to access government services and information online which eliminates or reduce the need for physical visits to government offices. This enhances access to government

services and reduces bureaucratic delays, leading to more efficient service delivery. The adoption of ICT ensures rendering of services to be done on appropriate time, very fast and with minimum resources. In Nigeria, the Nigerian government has implemented various e-governance platforms, such as the Integrated Payroll and Personnel Information System (IPPIS), the Treasury Single Account (TSA), and the National Identity Management Commission (NIMC) to provide citizens with online access to government services and information.

Furthermore, transparency and accountability in governance will improve if there is adequate utilization of ICT in a state. ICT or e-government creates the avenue for citizens to have access to government information, assess or evaluate the information and understand the operations of government. This will enable government to account and explain to the citizens how resources are utilized, what government intends to do and what government has done towards improving the lives of the people. In addition, ICT enables governments to publish information about their activities and budgets, allowing citizens to monitor government spending and hold public officials accountable (Jain & Dhar, 2018). The Nigerian government has implemented various measures, such as the Open Government Partnership (OGP) and the Freedom of Information Act, to improve transparency in governance and reduce corruption. With the utilization of ICT, the government has also established platforms for citizen engagement and participation in governance, such as the National Social Investment Program (NSIP) and the Whistleblower Policy (Nigeria Communications Week, 2019).

In aspect of citizens' participation, ICT serves as an avenue for citizen participation in governance. Through social media or online platforms, citizens will be able to engage in public consultations, express their opinions, and provide feedback to the government. ICT can enhance the monitoring and evaluation of government programs and policies.

2. National Security: ICT plays a crucial role in national security by providing advanced technologies for surveillance, intelligence gathering, and communication. The integration of ICT in national security has led to more efficient and effective methods for detecting

and preventing security threats and combating security challenge like armed robbery, kidnapping, assassination, cyber crime, cross border crimes, bandits, terrorism, insurgency etc (Nosiri & Ibekwe, 2016; Nosiri & Ndoh, 2018). One of the primary roles of ICT in national security is the use of advanced technologies for surveillance and monitoring. For example, governments use CCTV cameras, drones, and satellite imagery to monitor and track criminal activities and terrorist threats. These technologies will help security agencies to respond quickly to threats and prevent attacks. Evidences had shown that one of the challenges of combating terrorist activities in Nigeria was as a result of the poor utilization of ICT or technological gadgets (Nosiri & Ibekwe, 2016; Ugwueze, Onuoha & Nwagwu, 2016). To Ogu and Oyerinde (2014 as cited in Nosiri & Ndoh, 2018) "for national security to be restored; Nigerian government must rise to their responsibilities and take back control of cyberspaces and the transmissions that go on therein, before they are completely lost to resolute subversives." With the use of modern technological gadgets, it will enable security agencies to easily identify threat, share information, collaborate with institutions that relate with security and take actions towards preventing and combating any activities that pose threat to lives and properties. To Ekwutosi, Effiong and Bassey (2021) ICT can improve national security in area of disruption of terrorist financing, enhancement of communication among security agencies and interception of communication among terrorist groups, enhance surveillance, intelligence gathering, ensure effective coordination and easy identification of suspected criminals. In addition, the research conducted by Bulama and Shrivastata (2022) revealed that the security challenges in Maiduguri in Borno State is associated with poor utilization of ICT. The study revealed that there is general opinion that Nigerian police, Borno State Command, Maiduguri did not have adequate CCTV, and biometric to curb criminality. Also, their vehicles are not installed with CCTV and lacks equipment for monitoring the movement of people. According to Kemi (2016, p. 9)"IT will enable the nation to identify potential threats, share information more readily, includes authentication, availability, containment, detection and identification, privacy, recovery and new security models." The research of Kemi (2016) indicated that majority of security personnel sampled believe that effective application of ICT has a great positive impact on

national security and IT can improve national security through the utilization of GPS technology, CCTV, social networks, data mining etc.

In area of border issues, one of the primary roles of ICT in national security is the use of advanced technologies to monitor and control the country's borders. For instance, biometric technology can be used to track visitors to the country and monitor their activities. This can help prevent illegal immigration, drug trafficking, and other transnational crimes (Devarakonda, 2018). In Nigeria, there is the use of advanced technologies to monitor and control the country's borders leading to the establishment of e-border management system by Nigeria government, which uses biometric technology to track visitors to the country and monitor their activities (Ayegba & Mamman, 2018).

In the aspect of intelligent gathering, ICT also plays a vital role in intelligence gathering and analysis. Governments can use various technologies such as data analytics, artificial intelligence, and machine learning and other sources like social media, emails, and phone calls etc to collect and analyze vast amounts of data from different sources. This can help identify potential security threats and prevent attacks before they happen. The Nigerian government has set up various cybersecurity centers to monitor and analyze threats to the country's national security. These centers use advanced technologies to detect and prevent cyber-attacks and other security threats (Ojo & Popoola, 2018).

Furthermore, ICT plays a critical role in emergency response and disaster management. During emergencies such as natural disasters or terrorist attacks, ICT can be used to coordinate rescue efforts and provide critical information to the public. The Nigerian government has set up various emergency management systems that use ICT to coordinate response efforts in order to minimize the impact of disaster or attacks and saves lives (Ojo & Popoola, 2018; Alshehri et al, 2018a).

3. Enhancing the Productivity of the Public Sector: ICT is relevant for the productivity of public sector of any state. It is evident that use of ICT in the public sector guarantees effective service delivery, efficiency or reduction of cost, improvement of employees' performance, reduction

of bureaucratic bottleneck or protocols, accessibility of information (Ekwonna & Nosiri, 2015). ICT can significantly improve the productivity of public service by streamlining processes, increasing efficiency, and enhancing communication. ICT has helped to transform traditional manual processes into digital ones. Through digitization and automating of tasks, ICT can help eliminate redundant and time-consuming tasks, reduce errors, and improve the speed and accuracy of service delivery in the public sector.

Furthermore, ICT promotes e-Government in the public sector, which is the use of ICT to deliver government services to citizens and businesses. This involves online portals for paying taxes, applying for permits, and accessing information. E-government can improve access to public services, reduce wasted times, and reduce the need for face-to-face interactions (Alshehri et al., 2018b).

In addition, ICT can help in collaboration and communication in the public sector. ICT can also improve collaboration and communication within and between government agencies through provision of platforms for sharing information and collaborating on projects. Finally, ICT can facilitate a mobile workforce, allowing public servants to work remotely and access information and services from anywhere. This can improve productivity by reducing the need for travel and enabling public servants to work more flexibly (Bates et al., 2015).

4. Enhancement of Educational development: ICT has been playing significant role in educational development by transforming traditional teaching and learning practices and providing greater access to education. ICT helps to enhance teaching and learning processes because the use of interactive whiteboards, internets, educational software, and multimedia resources can make learning more engaging and effective. It enables teachers to create a more student-centered learning environment, where students can learn at their own pace and receive personalized feedback (Sharma & Kaur, 2020). In addition, ICT makes students to have greater access to information and learning resources. This can be done through online courses and e-learning platforms where students can learn from anywhere in the world and at any time. This is especially beneficial for students who cannot attend

traditional schools due to geographical, financial challenge, disability or other reasons (Wagner, 2014). The use of ICT through the e-learning can help the students to learn easily or engage in lesson from the convenience of their homes. Also, ICT through the internet will enable students to get more access to information or research materials for their study.

Okafor and Enemuo (2022) posit that ICT is the only platform of positively changing educational sectors and empowerment of graduated students. The study conducted by Chahari, Hamman, Nuhi and Gago (2022) revealed that ICT improves teaching and learning in Private secondary schools in Yola-North, Adamawa State, Nigeria; and there was a significant difference between utilization of ICT and non-utilization of ICT in teaching and learning in Private Secondary School in Yola-North. Furthermore, Ndalu, Nadulu and Wordu (2022) conducted an empirical study and revealed that the usage of ICT has a positive and a significant relationship with effective management of schools in Benue State, Nigeria. Therefore, ICT is an essential avenue or tools in school management and educational growth. Furthermore, the utilization of ICT in education contributes to improvements in the management of educational institutions. It will help the school management systems to automate administrative tasks like student registration of courses, payment of fees, attendance etc. Also, ICT has also contributed to the development of new skills that are essential in the modern workplace, such as digital literacy and computer skills.

5. Improvement in Employment: The role of ICT in employment is essential. One of the roles of ICT in employment is its ability to create new jobs, enhance employment opportunity. To Barnes and Hunt (2018) the emergence of new technologies like artificial intelligence, blockchain, and the internet have created new employment opportunities in various fields such as data science, digital marketing, and cyber security. Furthermore, ICT can also enhance employability by providing individuals with new skills and knowledge. Through online education and training programmes, individuals are provided with the opportunity to acquire new skills that are in high demand in the job market. Additionally, ICT tools like job search engines, social media, and online platforms can connect job seekers with potential employers and

opportunities, leading to greater employability (Fry & Boudreau, 2021). Furthermore, ICT can improve working conditions through the encouragement of remote work and flexible work arrangements. ICT can also promote entrepreneurship by helping individuals with the tools and resources to start their own businesses. Online marketplaces, crowdfunding platforms, and e-commerce websites provide individuals with the opportunity to start their own businesses.

6. Food Security: The utilization of ICT is essential for agricultural development and promotion of food security. With adequate utilization of ICT, it will enable effective farming and cultivation of goods and process of such goods in large quantity for easy access to the customers or consumers. The study conducted by Anser et al (2021) revaled that 1% increase in ICT adoption will most likely boost food security by 12% to 15%. They further noted that ICT and governance interaction may have about 15% positive influence on food security. To the International Telecommunication Union (2009 as cited in Anser, et al, 2021, p.4) "ICT can help increase food security by increasing supply chain productivity. ICTs will increase information flow between farmers, food producers, traders and consumers which will lessen the food wastage and increase reliability of food in the supply chain". In addition, Ejemeyovwi, Osabohien, Adeley and DeAlwis (2021) looked at the household ICT utilization and observed that ICT utilization by male farming household in Nigeria play crucial role on food security because 1% increase in male household ICT utilization leads to 0.68% increase in food security in Nigeria. Therefore, there is a significant and positive nexus between ICT utilization and food security. Furthermore, Olaniyi and Ismaila (2016) embarked on a study in Ondo State, and it indicated that ICT usage has significant effect on household food security status.

A study by the Food and Agriculture Organization of the United Nations (FAO) found that ICT can improve access to information, facilitate knowledge exchange, and enhance communication in the agriculture sector. This, in turn, can increase productivity, reduce losses, and improve food security (FAO, 2019). Mobile technologies or ICT can provide small-scale farmers with access to real-time market information, weather forecasts, and best practices in agricultural production. This, in turn, can help farmers increase yields, reduce losses, and access new markets (UNDP, 2019).

7. Promotion of democracy: The use of technology has the potential to promote democracy by enhancing citizens' participation, enhancing transparency and accountability, and improving government responsiveness, improving election process or monitoring etc in a state. In terms of election, ICT plays significant role in ensuring effective, efficient and transparent electoral process. The effective utilization of ICT goes a long way to prevent or reduce incidence of over voting, multiple registration, double voting, manipulation of voting or falsification of results, etc. The study conducted by Ayeni and Esan (2018) shows that the usage of ICT like electronic voters register (EVR), Automatic Fingerprints Identification System (AFIS) and Smart Card Reader (SCR) have reduced election irregularities in Nigeria election. In addition, Unwuchola, Adinlewa and Udehi (2017) revealed that the use of ICT was adequately used by key players in 2011 and 2015 general elections in Nigeria. Therefore, improvement of political participation was made possible because of the extensive use of ICT by key stakeholders before, during and after 2011 and 2015 general election. There was use of digital media or social media and other technologies by Independent National Electoral Commission (INEC), political candidates, electorate, civil society organizations and security agencies in 2011 and 2015 electoral process. This helped increase or promote people's participation in politics.

In terms of citizen Participation, ICT can promote citizen participation by providing platforms for citizens to engage with their elected representatives and participate in decision-making processes. Through the utilization of social media platforms, online forums, and mobile applications citizens can be able to express their views, provide feedback, and share information with others. The use of ICT can facilitate greater citizen participation in the democratic process, such as through online platforms for public consultation, opinion polls, and e-voting. This can enhance democratic legitimacy and accountability.

In another vein, ICT can enhance transparency and accountability in governance by providing access to information on government policies, decisions, and spending. Government websites, open data portals, and mobile applications can help citizens access information on government activities, track the performance of government officials, and hold them accountable for their actions.

ICT can also play a role in election monitoring in order to promote free and fair elections. Electronic voting systems, voter registration databases, and election observation software can help ensure the accuracy and transparency of the electoral process. In addition, ICT can be used to monitor and observe electoral processes, such as through the use of mobile phones, irregularities can be reported and the online platforms can be utilized to track electoral results. This can improve the credibility and integrity of electoral processes.

In area of activism and mobilization, ICT has also enabled digital activism, which allows citizens to organize and mobilize online to push for political change or address any political issues. Social media platforms, online petitions, and crowdfunding websites have been used to raise awareness, mobilize support, and advocate for political reform.

8. Improvement of Health Services: The effective utilization of ICT is essential for proper healthcare service delivery. The use of ICT has led to significant improvements in the quality, efficiency, and accessibility of healthcare services. For health services to be faster and effective, requires adequate utilization of ICT. ICT like electronic health records (EHRs), Telemedicare, Health Information Technology (HIT), Infection detection technologies, management software, surgical ICT tools, internet, ultrasound imaging device, national health care management information system (NHC/MIS), scanner etc plays positive role in enhancing delivery health services (Ogungbade & Abdul, 2022; Busayo, Olajide, Fagbuaro & Ajeyemi, 2022). The use of electronic health records (EHRs): has improved the efficiency and accuracy of health information management. EHRs enable healthcare providers to store and retrieve patient records electronically leading to better patient care outcomes. The use of EHRs has improved healthcare service delivery by reducing medical errors, improving patient safety, and enhancing clinical decision-making (Magrabi, 2020). Furthermore, the use of telemedicine has improved the accessibility of healthcare services, especially in remote and underserved areas. Telemedicine allows healthcare providers to diagnose and treat patients remotely through video conferencing, which has reduced the need for patients to travel long distances for medical consultations (Bashshur et al, 2016). In addition, the application of Health Information Technology (HIT)

improves healthcare service delivery by enabling healthcare providers to track patient data, monitor patient progress, and identify potential health risks. In another point, ICT also helps to provide health education to patients and communities. With the use of social media platforms, health care providers have been able to disseminate health information and promote healthy behaviors

Challenges of the ICT Development for Sustainable Development in Nigeria

In Nigeria there are factors that undermine the successful utilization of ICT. These factors include:

1. Inadequate Infrastructure: Poor access to facilities or infrastructure needed for the effective utilization of ICT is one of the major challenges that undermine the success of ICT usage (Ogungbade& Abdul, 2022; Ishember et al, 2022; Nosiri & Oloto, 2017). Nigeria still faces challenges with basic infrastructure such as broadband connectivity, and a reliable telecommunications network. This has hampered the deployment and adoption of ICT services and solutions. The report by Nigerian Communications Commission (NCC) (2021) indicated that only 43% of the population has access to the internet and the broadband penetration rate is only 37%. In 2015, the report by Nigerian Communications Commission (NCC) revealed that 17 percent of rural communities had internet facilities as compared to 79 percent in Urban areas and out of 17 percent, only 11 percent have access to broadband and services (Nosiri & Oloto, 2017).

2. Issue of power supply: Effective utilization of ICT cannot be possible without constant electricity supply. Therefore, poor utilization of ICT in Nigeria can be associated with irregular power supply. Most of the ICTs require power supply to function effectively. The study conducted by Ishember et al (2022) and Ndalu et al (2022) revealed that inadequate power supply pose a serious challenge to the usage of ICT for effective health services and educational development respectively. National Bureau of Statistics (NBS) (2020) revealed that only 39.6% of households in Nigeria have access to electricity

3. High Cost of ICT Services: The high cost of ICT services, as regards internet access and mobile phone tariffs, posed a challenge to the development of ICT. This limits people's affordability and accessibility to internets and other technologies, especially those in rural areas and low-income households. It was revealed that the 2020 report by the Alliance for Affordable Internet (A4AI) that the average cost of 1GB of mobile data in Nigeria is 5.5% of the average monthly income, compared to the UN target of 2% (A4AI, 2020). That is supported by the UN e-government survey report that the low and middle income countries find it difficult to realize effective e-government development (Nosiri & Oloto, 2017).

4. Poor ICT Literacy: Many Nigerians lack the necessary digital literacy skills to effectively use ICT tools and services. This is a major challenge in the efforts to bridge the digital divide in the country. The Nigerian Communications Commission (2020) found that only 38.5% of the population had basic digital literacy skills. According to a report by the International Telecommunication Union (ITU), Nigeria has a low level of digital literacy, with only 39% of the population using the internet in 2020 (ITU, 2020).

5. Cybersecurity Issues: Nigeria faces significant cybersecurity threats such as hacking, identity theft, and online scams. A report by the Global Cybersecurity Index (GCI) ranked Nigeria as the 9th most vulnerable country to cyber attacks in Africa. Additionally, the Cybersecurity Act of 2015, which seeks to address cybercrime, has not been effectively implemented (ITU, 2019; Igbinedion, 2020). Furthermore, it has been reported that Nigeria recorded 11,710 cybercrime cases in 2020 leading to N21.75 billion lost to cybercriminals (NCC, 2021).

**Conclusion and Recommendations**

In this contemporary time, no country can achieve development without modern technology. Therefore, effective ICT utilization is relevant for sustainable development in a state. This paper has revealed that ICT development is essential for sustainable development in Nigeria because it ensures good governance, promotes democracy, improves public service productivity, and enhances health services. In addition, ICT is needed for promotion of national security, improvement of educational development,

food security and ensures employment opportunity. However, it is observed that poor infrastructure, poor power supply, high cost of ICT services, poor ICT literacy and cybercrime issues are problems to the development of ICT in Nigeria. Therefore, there is need to take adequate measures to tackle the above challenges for effective adoption of ICT for sustainable development in Nigeria. We recommend the following:

i. There should be adequate provision of infrastructure like electricity, telecommunication networks, broadband connectivity
ii. There is need for adequate resources or funds as investments for successful e-government or ICT implementation.
iii. Adequate efforts should be made to ensure equitable spread of ICT throughout the different levels of government. This will help to ensure equal access or reduce the gap between the number of people that have access to and those that don't have access to ICT.
iv. There is need to develop adequate information security technology in order to prevent/reduce high rate of cyber crimes like hacking, fraud etc.

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