CHINESE DIGITAL SILK ROAD AND ITS IMPACT ON NIGERIA'S DIGITAL ECONOMY, 2015 – 2025

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF POLITICAL SCIENCE AND INTERNATIONAL RELATIONS, FACULTY OF MANAGEMENT AND SOCIAL SCIENCES, GODFREY OKOYE UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B. Sc.), IN INTERNATIONAL RELATIONS.

SUPERVISOR: DR. KINGSLEY EZECHI

JULY, 2026

DECLARATION

I, **Anicho, Chelsea Udochukwu** hereby declare that this research project titled: "**CHINESE DIGITAL SILK ROAD AND ITS IMPACT ON NIGERIA'S DIGITAL ECONOMY, 2015 – 2025**" was written and presented by me to Godfrey Okoye University, Enugu state and has not been presented anywhere for the purpose of acquiring any degree in International Relations

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APPROVAL

The research was approved by the Department of International Relations, Godfrey Okoye University, Ugwuomu-Nike, Enugu state for the award of Bachelor of Science (B.Sc) in International Relations.

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DEDICATION

This study is dedicated to God.

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ABSTRACT

This study examined the impact of the Chinese Digital Silk Road on Nigeria's blue and digital economy between 2015 and 2025. The study focused on how Chinese digital investments influenced Nigeria's digital transformation and rural broadband connectivity under China's Belt and Road Initiative framework. The study was guided by Neo-colonialism Theory, which explains how powerful nations maintain economic, technological, and strategic influence over developing countries through foreign investments, infrastructural projects, and technological dependence. A qualitative research design was adopted using descriptive and analytical approaches. Data were obtained mainly from secondary sources, including reports from the Nigerian Communications Commission (NCC), National Information Technology Development Agency (NITDA), National Bureau of Statistics (NBS), International Telecommunication Union (ITU), government publications, academic journals, and international development reports. Qualitative content analysis was employed in analyzing and interpreting the data. The findings revealed that the Chinese Digital Silk Road significantly contributed to broadband expansion, fintech growth, digital entrepreneurship, rural connectivity, maritime digitization, and smart logistics development in Nigeria. The study further found that rural broadband penetration increased considerably during the study period, thereby improving digital inclusion and access to online services. The study concludes that the Chinese Digital Silk Road accelerated aspects of Nigeria's digital and blue economy development through improved digital infrastructure, connectivity, and technological modernization. Sustainable digital development in Nigeria therefore requires stronger local innovation systems, improved cybersecurity governance, and policies that promote technological advancement and digital inclusion.

***Keywords**: Digital Silk Road, Neo-colonialism, Digital Economy, Technological Dependence, Blue Economy*

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The emergence of China's Digital Silk Road marks a pivotal extension of the Belt and Road Initiative, representing a strategic effort to integrate digital infrastructure, e-commerce, artificial intelligence, and smart technologies across the developing world. Initiated in 2015, the Digital Silk Road seeks to promote technological interconnectivity and digital globalization through investment in telecommunication, fiber optic networks, satellite systems, and digital capacity-building programs. For Nigeria, Africa's largest economy, this initiative intersects directly with national efforts to diversify the economy beyond oil dependence, strengthen ICT sectors, and expand digital financial inclusion. Thus, the Digital Silk Road has emerged not merely as an infrastructure partnership but as a transformative force shaping Nigeria's digital ecosystem (Yahaya et al., 2025).

The Digital Silk Road has played a major role in fueling the growing dependency on data-driven innovation, fintech, and online entrepreneurship that characterize the digital economy of Nigeria between 2015 and 2025. This online development is both an opportunity and a dependency because Chinese investments have expanded the pace of ICT development in Nigeria and relocated Chinese firms such as Huawei, ZTE, and China Telecom to strategic communication structures (de Oliveira et al., 2025). The outcome is that there is a two-tale of digital empowerment of enhanced connectivity and geopolitical entanglement due to technological dependence. Such dynamics can shed light on the complexity of the Chinese involvement in the digital transformation of Nigeria.

The blue and digital economy involving ocean-based industries, maritime logistics, and digital services in Nigeria has continued to be influenced by Digital Silk Road-related collaboration. The focus of the initiative on smart ports, exchange of maritime data, and satellite mapping facilitates the efficiency of the ports and ocean resources management in Nigeria, especially in the Lagos and Port Harcourt corridors (Alhassan, 2024). The maritime surveillance and logistics operations have been incorporated into the digital platform, which is in line with the blue economy policy of Nigeria. As a result of this, the Digital Silk Road serves to act not just as a technological bridge, but also as a maritime innovation network that reinvents the nature of Nigeria as a member of the international digital trade system.

The Chinese Digital Silk Road also increases connectivity of broadband in rural areas which is a long-standing developmental challenge in Nigeria. With the help of fiber optic projects by Huawei and ZTE, some rural areas have access to 3 G and 4G infrastructure and have been piloting 5G since 2018 (El-Kadi, 2024). Local businesses, schools, and hospitals can access the digital economy in Nigeria as these projects are frequently funded together with concessional loans. The connections between rural areas and the Digital world have become the basis of digital literacy and access to e-government, and it proves that Digital Silk Road interventions increase Nigeria in its fractured communication environment.

Nevertheless, the increasing presence of the Digital Silk Road has cast digital sovereignty and cybersecurity into question. Those like Cheng and Zeng (2024) indicate that the program is a versatile political slogan, so that China is able to pursue soft power in technology diplomacy without the strict strategic planning. This translates into infrastructural dependency in Nigeria where Chinese firms tend to manage surveillance networks, data centers, and cloud systems. Although these partnerships enhance the national capacity, long-term governance and data

security challenges are also raised. The difficulty is in how to strike a balance between infrastructural benefits and technological autonomy.

The theoretical basis of the involvement of the Digital Silk Road in Africa is grounded in the principles of South-South cooperation, as it is focused on mutual growth and development. Yahaya et al. (2025) note that the China-Nigeria association can be viewed as a changing pattern of interdependency where the two countries utilize digital investments in industrialization. This partnership, however, is still not balanced because China is offering technology and funding with Nigeria being able to offer access to the market and potential geopolitical location. The Digital Silk Road, then, reflects the greater economic system of power that forms twenty-first-century globalization.

Technology transfer and human capital development are one of the greatest dimensions in the influence of the Digital Silk Road in Nigeria. The Huawei Seeds for the Future scheme, as an example, has provided training to thousands of ICT students in Nigeria, boosting the technical talent of the country, and filling technological skills deficits (El-Kadi, 2024). Such initiatives have provided jobs and digital entrepreneurship, especially to the youth in Nigeria. However, critics observe that the majority of high-tech parts are still imported thus, denying Nigeria the independence of innovation and the development of local content. In this way, technology transfer is not complete and is mostly operational but not structural.

The Digital Silk Road is driven by the economic logic of globalization that provides insights into how digital industries act as sources of production, consumption, and cultural exchange. As mentioned by Mutibwa (2025), the digital economy sectors in China including e-commerce, fintech, and platform economy are the pillars of the growth of the initiative. In Nigeria, this has been expressed in the spread of mobile payment systems, online marketplaces, and applications used for logistics that link rural artisans and consumers

around the world. This change redefines the nature of labor relations, the consumption patterns, illustrating how the digital entanglement affects the socio-economic modernization.

Digital Silk Road has also reinforced digital policy frameworks in Nigeria at the governance level by signing bilateral agreements on ICT regulation, cooperation on cybersecurity, and smart governance. De Kluiver and Neethling (2025) note that the involvement of China has affected the transformation of the African digital governance framework to adopt infrastructure development models centered on state-centered approaches to data management. The National Broadband Plan (20202025) of Nigeria and the National Digital Economy Policy are both products of these influences because they focus on the security-led, government-led digital growth. It is this convergence that underscores the domestic regulatory culture as refounded by international cooperation.

The Digital Silk Road also creates discursive power, which is the capacity to construct discourses and standards concerning digital modernity, as well as beyond the infrastructure. According to Carrozza (2025), the Digital Silk Road discourse of China introduces technology as a means of mutual prosperity and implicitly advances the way Beijing governs digitally. In Nigeria, such a framing is consistent with the governmental ambitions of technological sovereignty despite the fact that the practical implementation is still reliant on Chinese knowledge. As a result, the project is a material and ideological phenomenon that impacts the Nigerian vision of digital development.

Another crucial element in the Digital Silk Road in Nigeria is that it is going to help bridge the digital divide in Nigeria. By 2025, over 250 towns in Nigeria will be linked to Chinese-supported fiber networks, which connect to e-commerce, e-learning, and telemedicine (Wang et al., 2024). These are initiatives that are in line with the National Information Technology Development Agency's objectives in Nigeria to make digital access equitable. The increased

connectivity has triggered small and medium-sized enterprises and the local innovation ecosystem has thrived both in the city and semi-urban regions.

However, the growth of the Digital Silk Road also presents Nigeria with economic risks in the form of debt funding and technological reliance. Yahaya et al. (2025) advise that the financial assistance offered by China is a fast-tracked way to develop countries, but it is usually coupled with long-term contractual agreements that can limit the policies. This can be seen through the dependence of concessional ICT loans in Nigeria, where repayment terms and the licensing of technologies are biased towards Chinese vendors. This situation highlights why Nigeria needs to trade off foreign aid and national innovation policies, which safeguard national interests.

The crossroads of the blue economy and the digital economy show that Digital Silk Road technologies employ resource management optimization. The Nigerian maritime and fisheries industry has now become more transparent and efficient through satellite imaging, smart ocean sensors, and tracking of digital logistics (Alhassan, 2024). These innovations add to sustainable economic development to allow the government to control unlawful fishing and enhance revenue collection. Therefore, the Digital Silk Road will be sustainable in terms of the environment and diversification of the economy, which is in line with the post-oil development vision in Nigeria.

Even with these developments, it is questioned whether there are any geopolitical implications of China becoming more influential on the digital front. According to Zreik (2025), the initiative is a development agenda and a strategic tool of widening the scope of normative power by China in Africa. Nigeria is increasingly becoming more compatible with Chinese standards of ICTs, thus marginalizing Western partners and making it difficult to arrive at multilateral frameworks of digital governance. Thus, Nigeria has to walk a fine line

between the international power sides to maintain technological pluralism and escape digital dependency.

Simply, the decade-long existence of the Digital Silk Road in Nigeria has transformed the digital and blue economy architecture in the country in a manner that is integrated with technological modernization and strategic vulnerability. It has increased broadband penetration, improved digital literacy, and entrepreneurship, but has also put in place asymmetrical dependencies threatening sovereignty. The reason why the initiative has been successful in Nigeria is its flexibility to the national development agenda and the ability of the policymakers to localize its advantages. In the case of Nigeria, the way to go is to convert infrastructural cooperation into sustainable digital autonomy.

1.2 Statement of the Problem

During the last ten years, the Chinese Digital Silk Road has contributed much to changing the face of Nigeria's digital transformation, mainly in the areas of broadband infrastructure, smart cities, and ICT capacity building. Besides enlarging connectivity and stimulating economic diversification, this joint effort has also led to serious concerns about Nigeria's technological sovereignty, data safety, and long-term dependence on foreign digital systems. The preponderance of Chinese firms in the Nigerian telecom sector and Truth is Chinese hardware and software predominate in national systems are signs of an increasing imbalance in the control of technology. And, though there is noticeable progress in rural broadband and digital entrepreneurship, there are still huge deficiencies in local innovation capabilities, domestic digital manufacturing, and the freedom to make policies. The key question is whether we see fast digital growth in Nigeria offered by the Digital Silk Road as sustainable development or a new way of technological dependence. This research intends to highlight the changing effects

of the Digital Silk Road, carried out mainly through China, on the digital and blue economy of Nigeria

Between 2015 and 2025. In particular, it intends to examine the impact of digital infrastructure projects in broadening access to the web, raising ICT skills, and bringing about diversity in economic opportunities in rural and urban milieus. It is also concerned about the risks associated with foreign-operated digital platforms in areas such as cybersecurity, digital governance, and data sovereignty. The study addresses these risks by looking at them in relation to technological progress and the vulnerabilities it creates. In the end, it will attempt to offer a well-rounded explanation of how Nigeria can take advantage of the Digital Silk Road cooperation and at the same time enhance its capabilities for sustainable digital independence.

1.3 Research Questions

This study will be guided by the following research questions:

1. How has the Chinese Digital Silk Road impacted Nigeria's blue and digital economy between 2015 and 2025?
2. How has the Chinese Digital Silk Road enhanced rural broadband connectivity in Nigeria between 2015 and 2025?

1.4 Objectives of the Study

The broad objective of this study is to examine the impact of the Chinese Digital Silk Road on Nigeria's blue and digital economy between 2015 and 2025. The specific objectives are:

1. To analyze the impact of the Chinese Digital Silk Road on Nigeria's blue and digital economy from 2015 to 2025.
2. To assess how the Chinese Digital Silk Road has enhanced rural broadband connectivity in Nigeria within the same period.

1.5 Significance of the Study

The study is highly relevant as it assesses in a very timely fashion the scope of influence of the Digital Silk Road promoted by China on the digital transformation agenda of Nigeria from 2015 to 2025. Focusing on the linkages between digital infrastructure, blue economy and national technological sovereignty, the study enriches what is known about the influence of the digital investment brought by foreign countries on national innovation capacity and policymaking at the local level. The study is an invaluable source of information for policymakers, development planners, and ICT regulators on how to manage international cooperation and strengthen the indigenous digital industry and data security.

This research will also contribute to a reflection on international relations, digital economics, and development studies because it extends the concept of South-South co-operation and its long-term impact to decolonized Africa's digital future. Besides theoretical relevance, the research intended to assist Nigeria in developing a sustainable, inclusive, and self-sufficient digital economy which could benefit from foreign partnerships without neglecting national interests.

1.6 Scope of the Study

1.6.1 Scope

This research explores the impact of China's Digital Silk Road on Nigeria's blue and digital economies from 2015 to 2025. It covers key areas such as broadband infrastructure, rural access to the internet, digital business creation, and technology joint efforts under the Belt and Road Initiative system. Also, the paper examines the legislative backdrop that is guiding Nigeria's digital revolution and points out how Chinese cooperation has helped shape the implementation outcomes in the public and private sectors.

1.6.2 Limitations

The time frame for this research is a big limitation alongside Really the researcher could not access some official records as a few of the project data and partnership agreements between Nigeria and China are confidential. Besides this, the research also experiences the limitation of In reality digital policies and technological trends are still evolving and thereby those which will be in existence before and after the research period may differ. However, the paper still manages to give a well-founded examination of the data, policy documents, and visible indicators of the growth of digital and blue economies within the set 10 years.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Conceptual Framework

2.1.1 Digital Silk Road (DSR)

The Chinese Digital Silk Road (DSR) is a digital, technical, and information-based dimension of the Belt and Road Initiative (BRI), which aims to reach its Belt and Road partner regions with digital infrastructure, platforms, and standards. The DSR has been developed as China realised that the competition of the world economy had switched from that of physical facilities to data, connectivity, and cyber-technologies (Ly, 2020). It was a concept that started to emerge as China attempted to make telecommunications, satellite communications, and digital business a part of its global development plan. China's efforts to connect digital infrastructure to trade corridors place the nation at the heart of the global digital economy, impacting the flow of information and capital around the world. The DSR is therefore more than just a technology programme; it is a geopolitical and socio-economic framework that influences digital futures.

The concept of DSR has become part of the Chinese policy discourse since discussions regarding the way the Belt and Road Initiative (BRI) should be developed to adapt to the world's digital transformation. As China's central leaders started to refer to the BRI as a “digital phenomenon”, able to support existing physical investments with the help of big data, e-commerce and smart technologies, the DSR gained significance, according to Ly (2020). With the gradual shift of the business world online, China saw it as an opportunity to build parallel digital corridors to enable trade and economic cooperation with the world. This shift from physical Silk Road partnerships to technologically advanced, cloud-based and platform-driven engagements was referred to as the 'digital Silk Road'. The conceptualisation of the DSR thus

embodies China's attempts to establish a network of interconnected technology-driven markets, in line with its digital capabilities.

As per Cheng (2022), the Digital Silk Road is the technological aspect of the Belt and Road Initiative, which is designed to complement physical development projects and digital capacity building in order to develop a comprehensive model of development. The DSR falls under the umbrella of China's foreign policy, which is aimed at fostering digital inclusiveness, economic cooperation and cross-border technological exchange. It includes innovative platforms, telecommunications, cyber-security, trading in the digital space and satellite navigation networks. The multidimensional nature sets the DSR apart from the previous stages of China's foreign infrastructure project. The DSR has a multi-dimensional aspect, unlike the previous phase of China's foreign infrastructure project that emphasized ports, roads and manufacturing centers. So, the DSR takes the BRI from physical connectivity to cyber-connectivity.

China first put forth a coordinated vision for global cooperation in the digital field at the Second World Internet Conference in 2015, the historical origins of the DSR. Guo (2022) mentions the concept of the “Digital Silk Road”, which referred to China's plans to create a common digital space by cooperating in broadband Internet, mobile communications, and cloud computing. During the subsequent Belt and Road Forums, China highlighted three key areas as pivotal for digital trade, data governance, and collaboration in 5G. Then, in the following Belt and Road Forums, China further refined this vision, tying three elements to digital trade, data governance, and collaboration in 5G. The timing was crucial because many developing nations did not have strong digital infrastructure and China was an attractive option for them to explore other digital technology vendors. The DSR thus became a model of interest as a good option for digital connectivity and technological development.

Triolo et al. (2020) point out that the Chinese leadership has always viewed the DSR as a tool to create a “digital community of shared future” and has clearly made a desire to influence international norms in the digital space its goal. This viewpoint mainly emphasizes collaboration, mutual benefits, and jointly managing the world of digital technology as a way of digitally integrating the world. Still, the initiative also opens up avenues for China to the overseas continents, resulting in debates about technological reliance, cyber sovereignty, and rivalry. The writers predict that the DSR turns China into the key character in the world digital governance discussions and offers the Chinese a chance to shape the regulations of international technological standards. Given this stance, the Chinese are not just seeking economic gain for themselves, but also aiming to be a leader in the establishment of norms in the digital age.

Ghiasy and Krishnamurthy (2020) suggest the DSR has implications of strategic importance in the context of global power dynamics, digital sovereignty and cyber-security. They see the building of a “Chinese digital backbone” in partner countries as one of the most significant achievements of DSR projects, including in the field of 5G infrastructure, national data centres and architecture. The developments boost the technological power of China as well as providing a low-cost alternative to Western digital systems. But they also raise questions for other powers that are wary of the growth of China's intelligence and cyber powers through its technologies. The DSR is thus situated in a very competitive international technological environment.

The impact of the Digital Silk Road on China's economy is significant, particularly in terms of boosting its digital economy and export capabilities. According to Hussain et al. (2024), the DSR enables China to “digitise its industries around the globe”, such as telecom, fintech, e-commerce, as well as renewable digital industries. Chinese companies could leverage the DSR to access markets, and digital dependency can be created through partnerships. With more and more countries embracing China's technological standards, China's global role in digital governance is consolidated, and it will be more influential in future technological innovation. The diffusion process is an example of digital cooperation having a wider economic impact.

The DSR revolves around infrastructure development, among others, in the context of 5G systems, fibre-optic networks and cloud infrastructure. According to Hussain et al. (2023), China is emerging as a key player in the digital infrastructure expansion in the world due to its fast technological advancement and competitive pricing. They emphasise how the geopolitical conflict between China and the USA, particularly over 5G technology, represents the world's struggle for digital supremacy. By introducing the DSR, China shares its digital system with the rest of the world, incorporating its own technological principles in the building of the partner nation's infrastructure. The expansion is indicative of China's geopolitical importance in digital infrastructure as a force of influence.

The DSR also covers cooperation in e-commerce, digital finance, and cross-border innovation networks for the purpose of facilitating digital trade between the participating states. Such efforts allow the developing world to "jump-start" the traditional industrial barriers and engage in digital markets facilitated by China (Cheng 2022). Web-based commerce is growing globally, and the DSR gives an opening for nations to participate in the most profitable areas of digital trade, such as cloud services, online marketplaces, and fintech ecosystems. This inclusion might lead to the generation of innovation in the area, give better access to the market, and uplift the region's economic diversification. The DSR thus catalyzes digital economic transformation, especially in emerging economies.

Growth of digital services usage, inadequate infrastructure, and dependence on mobile connectivity are bringing the DSR to the forefront in Africa. Eguegu (2022) says that China's digital partnerships with African countries address critical bandwidth access needs, digital training, and smart technology deployment. The DSR provides low-cost alternatives to Western technologies to African countries, and digital development strategies for digitalisation in the telecommunications, financial inclusion and e-governance sectors. These partnerships

can be part of national strategies to close the "digital divide" and/or meet national goals for modernisation of public services. Therefore, Africa is one of the most exciting areas for the DSR to be tested.

Nouwens (2020) underscores another difficulty when examining the DSR – there is no consistent public definition from the Chinese authorities, and the project is somewhat fluid and flexible to adapt to. The vagueness leaves room for China to adapt the digital cooperation frameworks to the needs and political environments of its partner countries. This flexibility makes the DSR more desirable, but also more difficult to analyze because it is hard to define which activities are clearly defined as under the umbrella of the DSR. This flexible way of framing the initiative allows it to be seen as both a strategy and a development. It also illustrates China's desire to maintain the flexibility of policy concepts in line with changes in the geopolitical situation.

To grasp the DSR, Cheney (2021) emphasizes the need to set the concept in the context of China's larger technological ascent to technological superpower status. The DSR represents China's efforts to promote not only its hardware, but also its data and governance standards, in the field of cyber-security and digital markets. China's efforts to make digital interdependence will expand its reach and influence beyond infrastructure, into the arena of world digital rules-setting. This influence can have an impact on the architecture of international governance, including that in the Global South. Thus, the DSR is an effective symbol of the changing technological and geopolitical image of China.

Overall, the DSR helps to transform the way data moves around the world, particularly with the increasing control of digital infrastructure by Chinese companies in partner countries. Triolo et al. (2020) highlight the importance of data governance, which is an integral aspect of the DSR but is not always recognised as much. China is connected to partner economies via

cloud computing, submarine cables, and hosting of data. This establishes intertwined connections whereby technological infrastructure and policy frameworks can be more and more aligned to Chinese models. These developments bring to mind issues of cyber-autonomy, digital rights, and governance issues in the long-term.

On the development side, the DSR will seek to narrow the digital divide by providing good-quality digital infrastructure at low cost, particularly in low-income areas. Guo (2022) sees the DSR as a way towards digital prosperity together with investments in e-learning platforms, telemedicine, digital agriculture, and smart city innovations. The initiatives are expected to help speed up socio-economic development by bringing communities into the global digital value chains. The developmental narrative resonates very strongly with countries that are trying to use technology in order to transform their countries. So, the DSR is basically a development and strategy digital project.

To sum up, the Digital Silk Road of China is a complex initiative that combines tech, economic, and geopolitical aspects, laying the foundation for worldwide cooperation. It helps to enhance China's influence via digital platforms and provides opportunities for digital transformation for partner countries in a swift manner. The DSR conceptual development is in line with the international trend of Data-driven Development, Cyber-infrastructure and Digital economic integration. Meanwhile, it raises questions around sovereignty and dependence, and the future of global digital power. To grasp the DSR, it is essential to grasp its development potential as well as its strategic meaning.

2.1.2 Broadband Connectivity

Broadband connectivity in rural areas means that a high-speed internet connection is available, accessible, and dependable in rural and/or remote areas. In the era of the digital economy,

where critical services are increasingly going online, rural connectivity is an important precondition for equitable access to the digital economy (Maxwell 2025). Rural communities around the world (developed or developing) have lower broadband penetration rates than urban areas, as a result of a combination of economic, geographical, and infrastructural factors. These circumstances hinder employment from being done remotely, trade from being conducted digitally, education from being delivered online, and healthcare from being delivered. Thus, the deployment of rural broadband is now a focus point of the national development plans in the effort of overcoming digital inequality. It is therefore essential to have a good grasp of rural connectivity to assess the developmental impacts of digital projects like the Chinese Digital Silk Road.

The “rural digital divide” exists all over the world and is particularly acute in rural areas. This gap suggests a divide between areas with sufficient digital infrastructure and areas with low levels or absence of basic digital infrastructure. Kibinda et al. (2025) have stated that having a robust broadband network in rural areas is important for inclusive digital transformation and socio-economic mobility. Their systematic review identified that infrastructure sharing, including sharing of towers, fibre ducts and broadband networks, could reduce deployment costs and speed up the process of rural access. Broadband connectivity becomes increasingly affordable for underserved communities when operators can jointly share some of the capital-intensive investments required. So, alongside technology, delivering rural broadband services will also call for sustainable policy setups, according to some opinions in the industry.

The effect on community life, economic diversification and population stability of the availability of broadband is actually significant, reports say. According to Mack et al (2024), access to broadband in rural areas can have impacts on migration, jobs, modernisation of agriculture and the development of small businesses. As a result, they say that a better Internet

connection helps break the economic isolation that is frequently associated with geographic isolation by allowing people in rural areas to engage in e-commerce, telework and distance learning. It is recognized that the absence of broadband has structurally made rural poor economies uncompetitive and left them high and dry. Thus, say these scholars, there's no time to waste if it's to make broadband access the “electricity and transportation of the 21st century”.

Education is the only sector in which the lack of affordable broadband in rural areas makes a difference. Mitra and Shah (2024) believe that slow internet speeds hinder students from accessing virtual classes and learning materials on the internet, as well as from being able to do well in these activities. In their paper, they raise the prospect that community broadband networks, affordable data plans, and mobile learning platforms could yield improved education for the rural population. Having the right Internet access might even determine whether or not students succeed in having a modern, information-based education. The writers suggest a wide range of policy interventions for elements of affordability, infrastructure construction, and digital literacy. How rural connectivity can socially impact educational equity is just one of many indicators of the linkage between broadband and equity.

New technologies keep driving transformation in the ways to reach remote areas with broadband service. Chakravarty et al. (2025) introduce clustered collaborative communication models that make for efficient networks and mitigate geographical limitations. They adopt a distributed communication technology to enable the sharing of communication resources among clusters by rural subscribers. This model minimises signal loss and enhances the stability of networks, which is ideal for low-density areas. These are innovations that suggest other methods of deployment than conventional fibre-optic routes, which can be costly in rural areas. Hence, new technologies could be used to close the rural connectivity gap, which has not been resolved.

The designation of “rural” is also hard to define in broadband planning, especially in determining what areas should be underserved. The definition of ‘rural' can vary from one country to the next, and can be adapted to the accessibility of a country, the population density, and the infrastructure within it, as mentioned by Cavalli and Santangelo (2025). They discovered that definitions of broadband are conflicting and that data collection, policy development, and distribution of resources for broadband projects are difficult. If broadband providers aren't aware of communities in the vicinity that would be classified as potential fringe, they could miss them, even though they are not quite connected but have issues with service speed and reliability. The authors make an argument that there needs to be more uniformity with respect to identifying underserved areas. This flow of clarity is essential when designing effective interventions that embody connectivity reality.

The approach of community planning has been effective in speeding up the progress of rural broadband projects. Ventimiglia et al. (2024) illustrate the importance of local partnerships, grassroots mobilization, and planning at a county level to attract investments and support infrastructure deployment. The Report on the progress of rural Florida counties helped to catalyze productive discussions and planning with local government, residents, and private operators. These collaborations helped remove some of the obstacles frequently encountered in rural broadband projects that are based on institutional issues. In their conclusion, the authors want to stress that there is a need for bottom-up strategies, too – and for rural communities to have a more integrated role in designing their own digital future. Therefore, the need for local agency is a key component to rural broadband expansion.

In the context of measuring the dynamics of rural economies, broadband can be viewed as one of the factors that affect entrepreneurs' growth. According to Strover et al. (2024), better connectivity positively impacts rural businesses, allowing them to utilize digital marketing,

online financial services, and remote work. Their research also reveals that quality – rather than availability – of broadband is a factor in the sustainability of businesses. Bad connectivity or instabilities hamper investments and digital adoption. Thus, the provision of a reliable and speedy service to rural areas is as important as the attainment of broadband. This helps to substantiate the claim that "broadband is an economic infrastructure.

5G broadband is introducing new possibilities to revolutionise rural connectivity. In rural areas, 5G is expected to provide higher speed, lower latency, and increased device capacity, which is particularly beneficial for logistics and telemedicine applications, as well as agricultural automation. In agricultural and logistics applications and remote areas, 5G is seen as promoting higher speeds, lower latency, and increased device capacity, which is especially beneficial for telemedicine and agricultural automation. However, the deployment of 5G infrastructure in sparsely populated areas is costly and will pose risks for the further digital divide. The author stresses that policies need to take affordability and the deployment strategies in rural areas into account in order to achieve equitable benefits. A successful rollout of 5G in rural areas could create and enable new industries and innovative rural economies. It is therefore an enormous opportunity to be realized through next-generation broadband technologies that will revolutionize rural areas.

Internet connection is also a driver of migration patterns in rural and remote areas. The authors Harrington and Hay (2025) also cite poor connectivity as another push factor for migration since migrants are seeking areas where they can have access to better connectivity. Better connectivity, however, can also help attract new residents, such as teleworkers and digital entrepreneurs who want to live somewhere that will be affordable. Their analysis shows that the internet is a socio-economic determinant of demographic stability in rural areas. This illustrates the impact of broadband beyond economic sustainability, also on social

sustainability. Therefore, connecting is an important aspect of population dynamics and rural resilience.

Although broadband deployment has been prolific globally, there is little broadband availability in many rural communities due to a range of technical and financial issues. Private investment in rural broadband is hindered by several factors such as the high deployment expense, difficult terrain, and the unappealing financial prospects, as Maxwell (2025) discusses. This vicious circle of low population density, poor infrastructure, and rural marginalisation is being compounded. It is therefore necessary for policymakers to think about mechanisms such as subsidising the deployment of rural broadband, public-private partnerships, and infrastructure sharing models to encourage the extension of rural broadband services. This could result in reduced expenses and operators running investments in new network deployments where they are not already operating. The key to universal connectivity is to tackle such constraints.

Infrastructure sharing is proving to be a viable option for increasing broadband in developing countries. Kibinda et al. (2025) highlight the advantages of shared fibre networks, co-located towers, and open-access platforms, all of which eliminate duplication and capital expenditure. The models encourage competition and access to the services by users. This is where sharing of infrastructure can help to overcome connectivity issues in an environment with a small budget in a developing country. But the authors contend that it is important to have support from regulations to capture the maximum benefit from shared infrastructure. This is a form of collaboration that is in keeping with best practice in the field of digital development in rural areas worldwide.

Broadband and rural socio-economic outcomes are a complex, multidimensional and interrelated relationship. Mack et al. (2024) demonstrate how broadband can facilitate civic

participation (digital governance tools) for rural tourism, integration into supply chains, agricultural innovation and civic participation. Rural people have been limited in access to basic services, in their ability to access digital markets, and in their ability to take an active role in public decision-making, without access to broadband. Poor connectivity compounded by the lack of it negatively impacts longer-term economic sustainability. This highlights the importance of rural broadband now being a development priority globally. This has led to connectivity expansion being a key part of national digitalisation agendas.

Broadband connectivity is a key enabler of inclusive development, digital transformation and economic competitiveness today, overall, in the rural landscape. The literature overwhelmingly shows that the connectivity of rural areas influences education, entrepreneurship, migration, health care and community resilience. While new technology capabilities create new opportunities, there are still major structural barriers, especially in low-income areas. Broadband expansion needs technology advances, policies that encourage deployment, community buy-in, and viable funding models. It is important to have this context to analyse the Chinese Digital Silk Road in Nigeria's broadband situation. For this reason, rural connectivity via broadband is a technical and socio-economic construct, which is at the heart of the national development process.

2.1.3 Digital Economy

A digital economy is an economy that is powered by digital technologies, infrastructures, flows and services. The digital economy has grown rapidly in Nigeria as well as in the 2015-2025 timeline as a result of the growth in broadband penetration, digital financial inclusion, mobile connectivity, and international digital cooperation, most notably the Digital Silk Road (DSR) by China. The digital infrastructure investments, which Nigeria has been making to align with

the DSR, have led to increased growth in e-commerce, fintech, e-governance, smart industrial platforms, and enhanced readiness of Nigeria for Industry 4.0 transformation.

The digital economy is at the core of Industry 4.0, which is characterized by the use of automation, big data, artificial intelligence, and interconnected systems, as highlighted by Javaid et al. (2024). Just like in the global Industry 4.0 environment, the Chinese DSR digital infrastructure – which involves fiber-optic networks, cloud facilities and digital training – creates enabling conditions for Nigeria.

The digital economy is central to the implementation of Industry 4.0, with automation, big data, artificial intelligence and interconnected systems being central elements to the process, Javaid et al (2024) assert. China's DSR-supported digital infrastructure (digital training, cloud facilities, fibre optic networks, etc.) provides enabling conditions for Nigeria comparable to those found to be applied in global environments for Industry 4.0. Javaid and colleagues' (2024) “defining trends and key enablers” align with the transition in Nigeria towards smart manufacturing, digital services, and new industries based on emerging technology. In this sense, the DSR framework's digital economy can be considered an economic growth platform and a modernization catalyst.

The digital economy is also a sustainability, innovation, and competitiveness concern for the nation in the long-term. The digital economy has been shown to enhance sustainability through its potential benefits in resource efficiency and green innovation, as well as through its role in data-driven governance, explains Raihan (2024). There is a need for the Digital Silk Road to be fruitful in Nigeria as it would enable sustainable growth through better digital finance systems, logistics and innovation ecosystems to foster tech-driven entrepreneurship. Meanwhile, issues of cybersecurity, dependence on digital technologies and regulatory

shortcomings are continuing concerns that need to be tackled in Nigeria to maximize the benefits of DSR.

Productivity and energy efficiency are also a reflection of the increasing role of the digital economy. In an in-depth study of how digital economy expansion creates energy productivity, Sun et al. (2024) demonstrate using a deep-learning model when digital inclusive finance and smart technologies are available. Nigeria is making strides in its digital infrastructure development, much like what has been seen in other areas such as telecommunications, fintech adoption, and streamlined industrial operations, with its work with the DSR. This shows how the DSR can really change things and what it can do as a driving force behind Nigeria's economy going towards energy saving and more technological development.

Digital financial systems are also a key part of the worldwide financial systems. According to Rachmad (2025), Central Bank Digital Currencies (CBDCs) and other innovations in fintech are not so much about the risk of finances, as they focus on new economic opportunities. The Digital Silk Road is also encouraging similar changes in Nigeria, which opened the first African country's eNaira. Besides technical cooperation, cybersecurity, and digital payment systems, the country has, as a result, secured its spot in global digital networks, boosted monetary inclusion, and decreased reliance on the traditional systems that are almost fully monetized, together with these developments.

In summary, the digital economy, driven by the global shift towards a digital economy and bolstered by the Digital Silk Road initiative of the Chinese Government, is a key strand of Nigeria's economic transformation by 2025 from 2015. It facilitates innovation in productivity, industrialization, sustainability, financial innovation, and cross-border digital connectivity and is an important concept to appreciate the wider implications of the DSR to Nigeria's blue and digital economy.

2.2 Thematic Review

This thematic review is done based on the aim of the study and is a compilation of literature that directly relates to the study problem. Themes provide academic perspectives and context to the study in the larger academic and policy debates.

2.2.1 Chinese Digital Silk Road and Nigeria's Blue and Digital Economy

One of the most prominent platforms for cooperation and collaboration in the digital world is the Chinese Digital Silk Road (DSR), and its impact on Nigeria's digital and maritime industry is immense. The DSR is the digital aspect of the Belt and Road Initiative, the technology that extends it, the deployment of this technology, the governance over the data, and the geopolitical influence in one strategic alliance (Carrozza, 2025). Nigeria's participation is indicative of the country's desire to build up its technological base and enhance its digital competitiveness in a way that will propel the country's transformation programmes. The cooperation between the two countries has gone a step further and not only covers traditional development assistance but also includes broadband deployment, digital trade systems, and maritime modernization partnerships. This way, Nigeria is positioning itself in the global scene of digital and blue economy collaborations. The relationship thus created gives a glimpse into the impact of global digital strategies on national development directions.

Infrastructure growth, particularly in fiber networks, data centers, and smart-port systems, is a major aspect of the DSR engagement in Nigeria by the Chinese. Digital instruments of influence and cooperation have been a constant theme in China's economic diplomacy as outlined in the Belt and Road Initiative and have served as the bridge to enhanced partnerships (Ezeanyika et al., 2024). This is a good thing for Nigeria as it improves connectivity and strengthens the telecoms sector, with the added advantage of more opportunities for innovation

in digital services. New digital platforms help to drive the growth of e-commerce, the development of fintech, and the use of digital solutions in the government's activities. DSR-related projects boost the technological foundation of Nigeria's economy, thereby enhancing the productivity and competitiveness of the economy. The infrastructural alignment also connects Nigeria with other areas of digital exchanges in the region.

In addition to infrastructure, the DSR provides opportunities to develop new norms, discourses, and digital governance practices that impact national and regional digital ecosystems. As Carrozza (2025) has pointed out, in cybersecurity, information sharing, and technological standards, there is a cooperative norm in countries along the DSR, further strengthening China's influence on digital governance. Nigeria's involvement is not out of the ordinary, as it involves technical partnerships and diplomatic coordination in digital policy. This will provide the opportunity to establish uniform standards within the security aspects of telecommunications, digital trade certification, and data management in the maritime field. As these norms spread, they shape the understanding of the digital risks, privacy, and sovereignty of Nigerian institutions. The normative as such continues the DSR beyond technology to governance orientation.

Nigeria's ties with the DSR also tie in with its political and economic diplomacy. The soft power approach of the Chinese government, which is based on infrastructure financing, diplomatic visibility and technological cooperation, encourages African states to further strengthen their relations (Ezeanyika et al., 2024). Nigeria is involved in this framework under several agreements in various sectors such as digital development, maritime cooperation, and partnerships for innovation. These battles establish political trust, promote long-term cooperation, and enable Nigeria to have other development strategies. Besides, they provide areas of discussion on maritime security, trade routes, and access to digital markets. The DSR's

diplomatic activities reveal the influence and impact of the DSR beyond the digital realm of bilateral ties.

In Nigeria's nascent ‘blue economy’ for which digital technologies play a significant role in modernisation and security, the DSR is also relevant. The maritime strategy is increasingly adopting a digital approach to maritime security and surveillance, to maritime port automation and maritime logistics platforms for improved economic and security functions (Awodeyi-Akinsehinwa et al., 2025). China's presence in these industries will enhance maritime consciousness and boost the efficiency of coastal operations of maritime trade. Enhanced monitoring systems assist in detecting illegal fishing, piracy, and smuggling, strengthening Nigeria’s role in the Gulf of Guinea. Smart-port technologies reduce congestion and accelerate cargo handling, improving regional competitiveness. Such changes bring Nigeria's maritime activities up to par with global digital standards.

In fact, the maritime element becomes increasingly significant when China's maritime route to the South Atlantic is viewed holistically. The Digital Silk Road is important to complement the Maritime Silk Road, as it facilitates China's expansion to strategic ocean areas, such as West Africa, according to Ferreira-Pereira et al. (2025). As one of the major coastal actors, Nigeria is a great partner for this maritime-digital linkage. This puts the country in a larger shipping chain, digital logistics chain, and data cables. The related digital tools increase visibility in the ports, the tracking of vessels, and trade predictions. It brings Nigeria's maritime significance to the fore and boosts its digital capabilities in these systems.

Another facet of the DSR's impact is China's growing footprint in the digital field in Africa, dubbed “digital expansionism.” China is competing with the world in the field of digital standards, surveillance technology, and 5G, among other areas where its digital footprint is crossing with the rest of the world in Africa, Kumar (2024) explains. In Nigeria, it entails

partnering in the digital space in a competitive international arena where China is a 'bargain' to provide infrastructure and training. This is because these dynamics make Nigeria a pivotal area in which to observe and monitor the dynamics of the major powers influencing digital futures in Africa. They also emphasize the strategic balancing that Nigeria needs to be involved in when diversifying its technological partnerships. Positioning determines the course and speed of digital transformation of the country.

Another significant sector where the DSR will affect Nigeria's economy is digital trade collaboration. The study by Gadafi et al. (2025) demonstrates the potential benefits of initiatives associated with the DSR in enhancing coordination of digital trade, but also highlights the new risks that come with regulation, interoperability, and transparency. As Nigeria's digital marketplace expands, its infrastructure must be improved, but data governance and cybersecurity needs are also critical issues to address. Along with these benefits, China provides support and new dependencies in the areas of digital trade systems for authentication, cross-border data flows, and financial compliance. These partnerships foster Nigeria's public institutions to be stronger. In sum, digital trade cooperation increases Nigeria's engagement in the digital value chains.

The economic studies also show that Chinese partnership in BRI boosts economic activity in Nigeria. According to Alhassan (2024), investment from China brings socioeconomic benefits in the form of revitalizing sectors of the economy that are related to infrastructure and technology. Digital improvements for DSR in Nigeria result in the creation of jobs in the ICT, logistics, and maritime sectors. These gains help the government to achieve its goal of diversification of the economy from oil to knowledge-based sectors. But coherent regulation and robust institutional controls are needed to unlock the benefits, however. The digital

economy therefore plays a significant role in overall national development, which is continually changing.

It is also worth noting that Nigeria's role in the DSR is related to environmental and energy issues. Tukur (2024) points out that energy systems and environmental policy are affected by Belt and Road economic activities, indicating the potential of digital infrastructure to promote or hinder sustainability goals. Port and logistics digital systems assist in minimizing inefficiencies, fuel usage, and delays, which is a secondary benefit to greening the maritime sector. Digital governance tools also enhance resource management and planning, especially in urban digital systems. However, as the digital infrastructure grows, so does the need for energy investments that should be in line with sustainability goals. The trade-off between the growth of digitalization and environmental responsibility is thus a key policy issue.

Data governance is another key pillar that comes into play when speaking of Africa–China cooperation and is featured prominently in the discourse on data governance. According to El-Kadi (2024), DSR partnerships are leading to a growing number of data governance frameworks in Africa created by the participation of countries in the partnership. This in Nigeria includes the policy development for data localization, privacy protection, and digital sovereignty. Improved governance arrangements support data management related to maritime and digital-economic activities – a crucial element for safe operations. Better governance structures also minimise risk from surveillance technologies and cyber vulnerabilities. The developments in these institutions are a testament to the maturing nature of Nigeria's digital economy.

All these scholarly views indicate that the Digital Silk Road is an enabler for both the technological and geopolitical aspects that influence Nigerian digital and blue economies. Interactions involving infrastructure, maritime systems, norms in digital space, governance

practices, and international diplomacy are highlighted in the literature. The opportunities of technology advancement, economic diversification, and efficiency in the maritime industry in Nigeria stem from its position within this framework. At the same time, the country will also have to deal with problems related to regulation, cybersecurity, and dependence on others. Grasping these factors paves the way for assessing how the Digital Silk Road could influence Nigeria's growth trajectory. Looking at the matter in this way not only helps with other sections of the literature review but also determines the method of analysis for this research.

2.2.2 Rural Broadband Connectivity Under the Chinese Digital Silk Road Framework

Broadband access has now become the major player in the driving force of the global digital economy, and the Digital Silk Road is an important idea when it comes to the expansion of the internet in rural areas of developing countries. Nigeria's collaboration with China in this field is a good example of the general trend in Africa of digital partnerships aiming at stopping spatial inequalities and bringing remote areas into the national development discussion. Per the DSR, improved rural broadband is not simply about the upgrading of the buildings; it is mainly about the new types of facilities that might change agriculture, education, health, and small businesses.

The Chinese-funded infrastructure projects are the backbone of the rural connectivity improvements in Nigeria - particularly in the areas where there has been no investment by either the government or private investors. The DSR highlights investments in fiber-optic infrastructure, satellite services, and mobile base transceiver stations to support increased availability of services in rural communities in several ways (Hussain et al., 2024). These investments help deploy connectivity services at a lower cost and speed network deployment in challenging areas. Nigeria reaps from China's wide-ranging technical expertise, and the rural communities can benefit from improved and more reliable internet services at cheaper rates.

These enhancements help achieve national digital inclusion targets. This is in line with China's global approach of providing connectivity as a development lever in partner economies.

The overall DSR environment also influences policy development and implementation to support rural broadband deployment in Nigeria. Carrozza (2025) proposes that the DSR is an attempt to develop a new discourse of sovereign digital development, thus allowing countries to introduce internet governance practices in line with their local priorities. This results in policy flexibility in Nigeria in drawing up rural broadband programmes which include a mix of aspirations and technological input. This leads to expanded use of digital tools in the rural sectors through the above governance structures. They also open up avenues for Nigeria and China to work together long-term on the regulatory front. The developments illustrate the institutional structure that is needed to continue to promote rural connectivity expansion.

Geographic inequalities have been associated with efforts of digitalization along the Silk Road, particularly in terms of providing rural areas with access to distance-based public services. Incorporating digital infrastructure into rural development systems increases market access, information, and administrative services, as shown by Yang et al. (2024). In Nigeria, Chinese-supported broadband investments have other impacts, such as providing access to remote communities to the national information network. The integration will help make rural economies more visible and make it easier to interact with government agencies. With greater access to digital, new rural economic behaviors and participation are emerging. These changes are representative of broadband's ability to help drive broader social change.

Construction of fibre optic networks is a critical element of enhancing the digital infrastructure in rural areas, especially in Nigeria. Fibre networks provide high-speed internet, reliable connections, and allow capacity to grow and be used for future technologies. Within the DSR context, investments in cloud architecture and digital platforms of service are usually part of

the same package of infrastructure investments that are necessary to ensure long-term operation. The benefits of the infrastructure to the rural areas of Nigeria have been made possible to access without incurring prohibitively high domestic investment. The resulting system can be used to enable advanced applications in Telemedicine, e-learning, and agri-tech. This puts rural economies in a better place to be more engaged in digital value chains.

Fiber rollout is complemented by Chinese satellite and wireless technologies, which can also provide connectivity solutions for communities that are not within the reach of terrestrial technologies. For several DSR countries, Chinese companies have been using satellite and wireless broadband techniques to enhance last-mile connectivity (Ong, 2025). This hybrid is especially suitable for Nigeria, where the geographical context of rural areas is ideal. Satellite broadband brings broadband coverage to remote rural regions, forest communities, and mountainous regions. Wireless systems offer flexible points of access when it is impractical or slow to build fixed systems. These technologies all contribute to the urbanization of rural areas by making them part of the national digital infrastructure.

One of the sectors that is seen to be positively impacted by extended rural broadband in DSR partnerships is education. Education is one of the sectors that has seen a positive impact under extended rural broadband in the DSR partnerships. With improved connectivity, rural schools can gain access to online learning tools, digital classrooms, and distance-teaching support systems (Zreik, 2025). This also helps to minimise the quality gap between rural and urban schools. Students in Nigeria are exposed to digital resources from around the world as well as mentoring from virtual mentors. The teachers integrate digital tools into their work to enhance teaching and learning and monitor student progress. These changes over time help to foster wider human capital development and increase digital literacy.

The DSR also has a big impact on agriculture, with expanded rural broadband. Improved connectivity provides farmers with access to weather forecasts and market price data, supply chain information, and digital financial services to increase their productivity. Digital tools contribute to reducing post-harvest losses, enhancing market linkages, and facilitating precision agriculture practices. The country's collaboration with Chinese tech firms provides Nigeria with a chance to access agricultural data platforms and logistics that are more adapted to the rural setting. These systems will help smallholder farmers to make better decisions and to reduce the risks of their operations. The income security and diversified economic opportunities of rural communities are strengthened with the development of Digital Agriculture.

Improved broadband connectivity also has a knock-on effect on trade in rural areas. Rural trade is also transformed with better broadband connectivity. Rural entrepreneurs know about Internet-based money transfer systems, e-commerce, and mobile banking. The Digital companies that have been established in Nigeria under the DSR have had a taste of success in other developing countries, where digital marketplaces could become successful if implemented correctly, and with the experience of the Chinese companies (de Kluiver & Neethling, 2025). This kind of system makes it affordable for small businesses and reaches a wider market. Increasingly, the rural traders in Nigeria are trading on national and regional markets via digital platforms. This digitization contributes to building an inclusive and competitive rural economy.

While tremendous progress has been made, there remain some areas of Nigeria's rural broadband development where there are gaps in the DSR program. But there are still some places in rural areas with lower speeds, higher costs, and fewer devices. While the differences in urban-rural access have reduced in countries with good broadband service, they remain, as

noted by Arsentyeva (2024). Nigeria's issues are also comparable in low-density regions and in regions with low infrastructure. People have a sustainability issue if the cost of maintenance is too high for the community. In all of these challenges, integrated, long-range planning is stressed.

Regulatory problems also impact the sustainability of rural broadband programs that are tied to the DSR. Liu (2024) highlighted that digital cross-border policy frameworks are not standalone and are linked with national data policies and raise both opportunities and uncertainties for countries participating in the process. In Nigeria, there is a need to strengthen the legal framework to guarantee secure data transfer, privacy, and transparency in the operations of the digital environment in rural areas. Lack of strong regulation may result in a risk to rural communities from data breaches, online threats, etc. Better governance in technological uptake within a time frame fitting the country's interests. There's a need for a regulatory balance for lasting digital inclusion.

Indigenous innovation in Nigeria is expected to impact significantly on the future of rural broadband expansion in the country as part of the DSR, through its ability to build on international partnerships. The adoption of technology, institutional capacity, and local adaptation are called for by Wan et al. (2025) to thrive and succeed towards a Digital transformation. There is a need to continuously invest in skills-based training, community governance, and awareness creation of digital entrepreneurship for the development of broadband connectivity in the rural areas of Nigeria. For Nigeria, the partnerships will need to be with China to build the infrastructure, but will need to be localised in the long term in order to be successful. There is a need for an inclusive approach for the full participation of rural people in the digital economy, and continuous progress will be required. This is how much value the DSR will be to Nigeria in the long-term.

The literature indicates that the Digital Silk Road offers a complete infrastructure on which Nigeria can progress rural broadband development. Digital governance cooperation and infrastructure supported by China has contributed to improving education, agriculture and rural trade. Rural connectivity is provided by all satellite, wireless, and fibre technologies. There are, however, some shortcomings and regulatory issues that indicate strategic planning and sustainability measures are needed. To measure Nigeria's progress in rural digitalisation in a global digitalisation agenda, the dynamics need to be understood. This provides a framework for the subsequent empirical work to be conducted in the other parts.

2.3 Theoretical Review

2.3.1 Technology Determinism Theory

For understanding Chinese digital growth, the concept of technology determinism theory is useful to understand the intersections between China's digital expansion and Nigeria's digital economic trajectory. The theoretical base is based on the thinking of communication and social theorists of the early 20th century, including Thorstein Veblen and Marshall McLuhan, and later, technological sociologists who maintained that technological innovation is the key determinant of social structures, economic organization, political power relations, and the behavior of institutions. At the core of the theory is the assumption that the nature of the technology, its scale, and degree of control have an impact on patterns of development and dependency, which may occur regardless of local agency after pathways to adoption have been established (Quan, 2025). The Technology Determinism Theory uses digital infrastructure not only as a neutral tool, but also as one that is able to re-imagine governance, re-order economic hierarchies, redefine data regimes, and re-imagine long-term development trajectories, all within the context of the Chinese Digital Silk Road. In a country with a digital economy policy that prioritizes technology-driven diversification, the introduction of ICT systems like fibre

backbones, 5G infrastructure, cloud technologies, undersea cables, and surveillance systems from China begs the question of whether technology is creating a new national autonomy or integrating externally imposed development agendas into Nigeria's digital landscape (Hu et al.(2024)e.). The theory then becomes key to understanding the implications of the technological architecture deployed via the Digital Silk Road on the outcomes of Nigeria's digital economy.

One of the primary tenets of the Technology Determinism Theory is that once a technological system is ‘in place', it influences the actions of institutions, priorities, policy decisions and economic structures in a way that limits development options. In this regard, digital partnerships with funding from technologically advanced states tend to have asymmetric results because the standards for designing the technology ownership remain in the hands of the technologically advanced, and the potential upgrading paths are controlled by the technology originators. The Digital Silk Road is an initiative where China's ICT companies, hardware providers, and state organs are the architects of technological ecosystems and make the decisions on the digital routes that African states, including Nigeria, will take. The theory is different from technology adoption, in the sense that it is a temporary fix for infrastructure gaps, and technology embeddedness, in the sense that it will steer the innovation capacity in the future. If a foreign system is designed, and there hasn't been any other concurrent domestic innovation that has a leverage effect on the system, the receiving state can become a technology consumer instead of a technology shaper. The experiences show that, without negotiated diffusion mechanisms, infrastructure-first digital expansion without benefiting domestic value chains may be constrained by a lack of negotiated bargaining space in national policy frameworks (Quan, 2025).

Technology Determinism Theory also points out that digital infrastructure today is a political-economic device, which is used to create technological standards, architectures of data and platform ecosystems that determine the power relations in global markets. The Digital Silk Road also provides a prism for understanding the export of norms, systems, and logics of data management, cybersecurity, surveillance, and platform regulation in the states that China invests in. This technological imprinting is the point of making the digital system a force that shapes and forms governance behavior as opposed to simply facilitating it. Technological forms have a regulatory, market, and strategic response over time, including through the deployment of 5G and smart infrastructure corridors. In that sense, the issue of Nigeria's digital independence cannot be divorced from those that influence the standardization of technology, updates, and interoperability of systems. In the absence of localization protection, the adoption of technology by users can either catalyze transformation or promote technologies that are externally shaped, which is why technology determinism takes a different perspective on digital adoption as a pathway to transformation (Hu et al., 2024).

2.3.2 Social Exchange Theory

Social Exchange Theory is a basic theory of analyzing relationships between actors in terms of their mutual exchanges of benefits, obligations, and expectations that occur over time. The theory is derived from sociological theory, and it became a theory of organizational and institutional analysis; it is based on the notion that actors enter into relationships when they see the perceived rewards of such relationships as greater than the cost. Social Exchange Theory clarifies the process of how trust, commitment, and continued cooperation develop in a situation in which exchanges are seen as mutually beneficial and fair in organizational and policy contexts. The theory is based on the idea that relationships are not solely based on transactions but come into being through repeated transactions and become normed as

obligations and reciprocities. In the context of development partnerships, Social Exchange Theory sees cooperation as dependent on the relationship between contribution and return as opposed to the existence of formal contracts. This is especially important in the context of international digital partnerships and economic partnership and their impact on long-term commitment and retention.

Social Exchange Theory suggests that when a person is treated fairly, he or she will feel bound to the person and will have a more stable relationship. One central idea of social exchange theory is that there is a link between equitable treatment and feelings of obligation to the person and between feelings of inequitable treatment and the size of the obligation to the person and the size of the commitment to the person. Fatema and Das (2025) further prove that organizational commitment acts as a mediating variable between perceived fairness and retention outcomes, strengthening the notion of the importance of recognizing each other's values in achieving value-added cooperation. They find that a sense of consistency in the benefits they're receiving as compared to the benefits they're contributing to increases commitment and the likelihood of maintaining a relationship. This learning goes beyond the boundaries of individual organisations to institutional and trans-border partnerships, with the need for ongoing engagement arising from perceived mutual benefits. Whereas in exchange with a development focus, commitment is the process that helps to sustain the cooperation even in the face of uncertainty. Social Exchange Theory, therefore, emphasizes commitment as a strategic result of participation, instead of it being more of a given. This is an approach that is transferable to large-scale economic and technological co-operation between asymmetric actors.

Social Exchange Theory further provides an explanation for the role of uncertainty in influencing exchange behavior by raising the significance of trust and relational commitment.

In the context of environmental uncertainty, the actors are more likely to adhere to relational norms, which help to maintain cooperation and information sharing, according to Li et al. (2024). In situations where future outcomes are not known, they found that commitment is a stabilizing factor that diminishes opportunism. This indicates that exchange relationships are not necessarily short-term, as this theory suggests, but rather are long-term investments in relational exchange. Uncertainty increases the urgency to have credible reciprocity signals in institutional partnerships. This leads to the emergence of commitment and trust mechanisms as crucial factors to keep cooperation going in fluctuating economic or technological situations, as predicted by Social Exchange Theory. The theory can hence be applied to analyse the reactions of the actors to uncertainty in complex exchange systems.

Furthermore, the role of Organizational commitment as a relationship resource is another important aspect of the Social Exchange Theory. Melkamu's (2023) research shows that job security, fairness, and mutual benefits have a significant positive impact on organizational commitment and retention. The study confirms the thesis that the presence of material and psychological rewards on the part of the exchange relations keeps actors in place. In this context, commitment is considered to be a sign of continuity and equity of the exchange. In the context of institutional / policy partnerships, commitment represents the trust level in the partnership. Social Exchange Theory views commitment as a result of, but also a stabiliser of, exchanges. It is especially relevant in the context of analysing longterm cooperation frameworks which rely on ongoing cooperation and engagement and not on single transactions.

The theory also makes sense from the perspective of the effects of flexibility and adaptive arrangements on exchange outcomes. Tsen et al. (2022) discuss how the theories of Social Exchange Theory and border theory can be used to understand the effects of flexible arrangements on turnover intentions. According to their study, the positive aspect of flexibility

appears to increase commitment, not when it is seen as a burden, but as a positive help. This underlines the principle of Social Exchange, which has been argued as the core assumption in the social exchange literature, that P.O.S. increases the strength of relational connections. At the broader level of institutional arrangements, adaptive policy arrangements could also help to build commitment if they signal reciprocity and responsiveness. This suggests that when there are rigid structures, exchanges become less robust when they do not match with the other person's expectations for relation. Social Exchange Theory thus suggests that it is responsiveness that is crucial in maintaining cooperative relationships.

Social Exchange Theory has been used in a variety of settings other than the employment relationship, such as supplier relationships and inter-organizational relationships. Being reciprocated and culturally compatible is found to be a basis of preferring treatment, which further increases supplier satisfaction, as shown by Mirzaei (2023). The study points out that not only do contractual conditions influence sustainable cooperation, but also relational satisfaction. This discovery is in line with the Social Exchange theory that suggests that individuals will compensate partners who are fair and reliable. The same logic implies that over time, institutional exchanges may cause a lack of willingness to cooperate if one party perceives it is losing out. The social Exchange Theory thus helps to explain the outcomes of longterm collaboration as a function of the quality of the relationship. This insight is very important to assess power imbalances in partnerships.

Social Exchange Theory is also often meshed with other theories to explain complex outcomes of organizations. This is because Kassa and Tsigu (2022) combine the two theories, Social Exchange Theory and the resource-based view, to gain understanding of how engagement and innovation are formed in the organizational relationships. Their analysis demonstrates that if one perceives fair exchange, then their input into the innovation process is at the discretionary

level and has a positive effect on the outcomes of the innovation process. This further strengthens the case for a shift towards reciprocity in order to create value, as it goes beyond the formal requirements. With institutional partnerships, there can also be a mutual exchange of ideas that can drive innovation and capacity building. Social Exchange Theory then offers an explanation for behaviour which relates to the fact that cooperation leads to productive outcomes. It's flexible enough to fit in with other approaches to theory, while remaining explanatory.

Social Exchange Theory also has been applied to digital and platform-mediated contexts. Xiao et al. (2025) show that there is a relationship between social exchange mechanisms and the brand ambassadorship and value co-creation in tourism platforms. They found that feeling a benefit leads to ongoing involvement and helps them to become advocates. This highlights the applicability of the Social Exchange Theory to understanding the behaviours in digitally mediated ecosystems. Virtual and/or platform-based interactions do not undermine exchange relationships. The theory is therefore easily applicable to the modern digital domain where trust and reciprocity are facilitated with technology. Its adaptability makes it very handy for investigating today's economic and institutional transactions.

These latter two perspectives continue to add depth to the theoretical scope of Social Exchange Theory. Uzir et al. (2025) find that satisfaction and loyalty are outcomes of reciprocal exchanges, which are in turn affected by communication and perceived fairness. Their study shows that the outcomes of the relationships are a function of the delivery of a benefit, not just one-off incentives. This further validates the idea that relationships are a key part of the theory, and that they are carried out in a long-term manner. In an institutional setting, cooperation is also dependent on continuous reinforcement of values. Therefore, Social Exchange Theory

offers a uniform basis at the individual, organizational, and institutional levels. Being applicable to areas, it becomes more robust in its analysis.

In the grand scheme of things, the theory of Social Exchange is a powerful model to understand how commitment, trust and reciprocity influence the relationship between two parties in a complicated exchange process. This theory helps to understand why exchanges seem fair, adaptive and beneficial to actors keep them engaged. It points to commitment as one of the key mechanisms that is necessary to maintain cooperation in an uncertain and asymmetric environment. Its basic postulates are well substantiated in empirical research in the area of organizations, supply chains, digital and consumer settings. The Social Exchange Theory is therefore an excellent theoretical basis to examine the dynamics of relationships in modern economic and institutional settings. It is especially well suited for assessing the ongoing cooperative efforts over time, because of its focus on reciprocity, commitments, and perceived fairness.

2.4 Empirical Review

Zreik (2025) carried out in-depth research on China's Digital Silk Road (DSR) and its impact on digital transformation in Africa. The study, which used data from regions and reports compiled by various sectors, found that digital interventions in China, such as fibre-optic rollout, data centres and digital-skills academies, have brought the continent's connectivity to a new dimension. The study identified major Chinese companies like Huawei and ZTE as key to the development of telecommunications infrastructure, increasing Internet penetration, and decreasing deployment costs. This is crucial to the current study as it offers a foundation for the empirical knowledge of the impact of similar DSR-led investments on the digital economy of Nigeria in the period of 2015 – 2025, specifically in the aspects of infrastructural development and digital access.

de Kluiver and Neethling (2025) studied the implications of the DSR of the Chinese government for the regulatory and governance transformation of the digital world in Africa. The researchers, using document analysis and expert interviews, identified the positive effect of the DSR on the strengthening of digital infrastructure alongside governance issues in the fields of cybersecurity, data protection, and regulatory harmonization. Their research shows that African countries tend to adjust their national policies for technology in accordance with the Chinese technological systems. The current study is relevant because their aspect of the DSR on technology bilateral agreements has affected Nigeria's digital regulatory reforms, particularly in cybersecurity and data protection aspects of digital surveillance in the country.

El-Kadi (2024) looked into the technology transfer mechanisms in the DSR through interviews with beneficiaries of Chinese ICT training programmes in North Africa. The study revealed that Chinese firms offer a variety of training, scholarship and capability development initiatives which enhance local human resources. It added, however, that the level of technology transfer so far is low, as the country is relying on imported Chinese equipment and the maintenance structures are in the hands of contractors. The study is based in North Africa, but the results are similar to what has happened in Nigeria, where ICT skills have been enhanced through the training of vendors by Huawei and ZTE, but the country has remained dependent on these two companies for technology.

Yahaya and Nurudeen (2025) have evaluated the potential and problems of Nigeria – China relations in the period 2015 – 2023, and identified that ICT cooperation is one of the promising areas of bilateral relations. Their findings showed that the Chinese-funded ICT projects significantly improved the digital infrastructure in Nigeria, but also posed transparency and debt exposure and structural dependence concerns. This is significant in the current study as it

emphasizes the ambivalent nature of the outcomes of the DSR in Nigeria; the quick digitalization process and fears of economic self-sufficiency and infrastructural sustainability.

Wang et al. (2024) used China's digital cooperation model with Ethiopia to study the governance model of DSR investments. They also identified that inadequate domestic governance structures increase vulnerabilities, including a lack of local participation, opaque procurement systems, and data insecurity. This analysis is important for Nigeria because if regulatory capacity is the crucial factor in determining the long-term developmental value of DSR investments, then similar governance concerns underlie Nigeria's digital contracts with Chinese companies, strengthening this argument.

To understand the broader China–Africa digital economic relationship, Mutibwa (2025) examined the impact of Chinese digital platforms on Africans' consumption practices, gig labour and digital entrepreneurship. The study illustrates the extent to which Chinese applications, e-commerce platforms and payment solutions have infiltrated African markets with the help of platform analytics and industry information. This is directly transferable to Nigeria, which has been influenced by China-linked digital platforms and fintech systems in the digital commerce space since 2015, along with the creation of new gigs and innovation centres.

For Carrozza (2025), DSR is a strategic tool to export Chinese digital norms like cyber-sovereignty and state-centric governance models. The study noted that there is a close relationship between users' interaction with the Chinese digital infrastructure and the dynamics of national discourse around surveillance, data localization, and regulation of the digital space. This is what Nigeria is facing, as the Chinese have been more and more involved in the digital economy along with the escalation of policy debates on cybersecurity, data governance, and monitoring the internet.

Okwuobi (2025) analysed the digital diplomacy of China in Africa and showed that the DSR is an instrument to develop a more intimate geopolitical influence. The research found that China uses ICT cooperation deals, cyber security deals, and digital skills training in order to enhance diplomatic relations. This is significant to the current study since it provides background information on the diplomatic support for Nigeria's involvement in DSR-related projects.

The study entitled Digital Silk Road and Nigeria's Democratic Stability was performed by Bedekenana and Etemike (2025). The aim was to understand the role that DSR-related partnerships play in Nigeria's governance, politics, and digital security. They used document analysis and interviews with ICT stakeholders and policymakers to achieve the qualitative approach. The study showed that DSR projects overlap considerably with governance arrangements, have raised concerns about the digital security of the project, and have provided opportunities for political influence and change, which pose both opportunities and vulnerabilities. Comparisons with the current study are that it is also an investigation into the implications for political and governance issues of Chinese digital engagements. The present research, however, differs from Bedekenana and Etemike's study by focusing on the general effects on Nigeria's digital economy between 2015 and 2025, while their study focused on democratic stability.

Uvere and Chijioke (2025) carried out Digital Economy and E-Commerce Cooperation in Nigeria–China Relations. The aim was to determine the impact of the digital economy partnerships between China and Nigeria on the economy. The study involved both survey modules from Nigerian ICT companies as well as analysis of the trade reports, which revealed that there was a tremendous growth in the level of collaboration between the digital economy and e-commerce, which had a positive impact on digital infrastructure and business connectivity. The study's focus on ICT-led economic partnership and developmental impact is

similar to the current study. The scope of the differences is different, since Uvere and Chijioke focused on bilateral trade dynamics; this research investigates the infrastructural, technological, and policy aspects of DSR in Nigeria.

Alhassan (2024) conducted a study on the Socioeconomic Impact of Chinese Investments under the Belt and Road Initiative in Nigeria. This study was designed to assess the impact of the Chinese BRI projects on the adoption of technology, sectoral growth and employment in Nigeria. The study, which took a quantitative approach and relied on secondary data from government reports and industry surveys, revealed that investments in technology, growth in the digital sector, and partial sustainability projects increased. The similarities between the two studies are with respect to the growth of the digital sector and infrastructural development; while Alhassan focused on socioeconomic impacts, the current study focuses on policy and governance aspects of the DSR as well as its long-term strategy implications.

Arsentyeva (2024) has examined Huawei's Activities in Nigeria and DSR Lessons from Latin America and the Caribbean. It aimed to evaluate its operational strategy, governance issues, and reliance on technology in its DSR initiatives around the world. The analysis showed governance dilemmas, dependency on vendors, and infrastructural debates that were similar to those in Nigeria using a comparative case study methodology. The difference is that the present study focuses on the Chinese influence and infrastructure deployment in Nigeria, where Arsentyeva has a comparative international approach, while the similarity is that both have a clear focus on Chinese influence and infrastructure deployment. The similarity is that both have a clear focus on Chinese influence and infrastructure deployment, while the difference is that the present study is Nigeria-specific and covers 10 years (2015–2025), whilst Arsentyeva has a comparative international approach.

Under the theme Digital Infrastructure Development under BRI: Chinese Dominance in Africa's Telecom Backbone, Ayodele (2024) hosted a panel discussion. The purpose of the

study was to create a map of dominance of Chinese investments in African digital infrastructure. The study identified Chinese companies as the biggest investors, having a firm grip on key backbone networks, through document analysis of investment records and by analyzing the statistics of the telecommunication industry. Comparable with the current study is the attention it pays to the infrastructural dominance of the Chinese, while Ayodele's study is more geared towards patterns in the continent as a whole, rather than Nigeria's national outcomes in the digital economy.

China's Economic Diplomacy and Soft Power in Nigeria: ICT and BRI Linkages was done by Ezeanyika, Obi and Mensah (2024). The aim was to examine the effects of the digital initiatives of the BRI on the institutional and diplomatic relationship between Nigeria and China. The study gathered data through policy document review and elite interviews, and identified that DSR frameworks helped to build institutional ties and foster long-term strategic digital partnerships. The similarities are that institutions are aligned and strategic partnerships are established; differences are that Ezeanyika et al. stress Diplomacy and Soft Power, while the present study concentrates on the economic and infrastructural impact.

Ugochukwu (2025) carried out Research on Nigeria – China Trade Development: ICT Investments and Digital Trade 2015 – 2022. It aimed to explore the role of ICT in bilateral trade growth. Analysing trade data and firm surveys, it was observed that digital trade and investments in ICT gained importance. Similarity with the present research is the focus on digital partnerships as a driver of development, while the difference is Ugochukwu primarily examines trade flows, whereas the current study integrates policy, infrastructure, and technology transfer analysis the present study integrates policy, infrastructure, and economic effects.

Gap in the Literature

Although the impulse towards empirical work on China's Digital Silk Road (CDSR) in Nigeria has grown, there are still quite a few gaps to be filled considering the country's digital economy. A lot of the research currently done is on the African continent overall or concentrated mainly on countries like Ethiopia and Kenya, This way leaving Nigeria, one of Africa's largest digital markets, relatively understudied in long-term empirical work. Most of the literature focuses on DSR infrastructure and diplomatic facets, with very little exploration of micro-level economic segments like digital productivity of Nigerian SMEs, labor market effects, and local value-chain participation.

Another major shortcoming is an almost complete absence of empirical research on how DSR investments from 2015 to 2025 have led to changes in regulatory systems, cybersecurity position, and data governance in Nigeria. Sure, several studies highlight governance issues, but hardly any of them offer a thorough analysis of the evolution of Nigerian policies that are directed at Chinese digital collaborations. In addition, DSR impacts by gender, income groups, and regional disparities are rarely examined in studies, thereby concealing the distributional effects of digital expansion.

And, only a handful has examined / hardly anyone has examined the role of vendor dependency, copyright issues, and the displacement of local industries in Nigeria due to DSR initiatives. While economic sustainability is one of the main concerns of the DSR projects, it has been a very much overlooked area of research, mostly with procurement transparency, indebtedness, and local capacity retention.

Addressing these issues, this paper seeks to carry out a Nigeria country-specific empirical investigation of the impact of DSR on infrastructural governance, economic participation, and digital policy development from 2015 to 2025. It uses longitudinal data, firm-level evidence, and sectoral analysis to offer a better understanding of how China's Digital Silk Road has influenced Nigeria's digital economy over the past decade.

CHAPTER THREE

METHODOLOGY AND THEORITICAL FRAMEWORK

3.1 Theoretical Framework

A theoretical structure offers a conceptual foundation that directs how research data are analyzed and interpreted (Luft et al. 2022). This research work investigating the influence of the Chinese Digital Silk Road on Nigeria's blue and digital economy during the period 2015 to 2025 has utilized Neo-colonialism Theory as the main theoretical system. Neo-colonialism theory emphasize that although colonialism formally ended in many developing countries, powerful states and multinational actors continue to influence the political, economic and technological structures of less developed nations through indirect forms of control (Nkansah et al., 2025). The theory argues that economic dependency, foreign investments, technological dominance and external policy influence often allows advanced countries to shape the development patterns weaker states while maintaining strategic and economic advantages (Sulaiman et al., 2024). According to the theory, foreign aid, loans, infrastructure projects and technological partnership may create dependency relations that limit the sovereignty and independent development of developing nations (Imbong, 2023).

In the Nigerian context, the Chinese Digital Silk Road represents a major technological and infrastructural and initiatives under Chinas Belt and Road framework. Through investments in in broadband infrastructure, telecommunication, digital platforms, and smart technologies, China has expanded its influence within Nigeria's digital and blue economy sectors. While these investment contribute to digital transformation and economic modernization, they also raise concern regarding technological dependence, data control, cybersecurity, debt obligations, and foreign influence over Nigeria's digital infrastructure (Nkansah et al., 2025). Neo-colonialism Theory therefore provides an appropriate framework for understanding how

external technological investment may simultaneously promote development while deepening dependency and foreign influence within Nigeria's economy.

3.1.1 Neo-colonialism Theory

Neo-colonialism Theory is a political and economic theory associated with scholars who examined how former colonial powers and emerging global powers continue to dominate developing countries through indirect economic, political, and technological means (Sulaiman et al., 2024). The theory was widely accepted after the many proclamations of political liberation in Africa, Asia, and Latin America during the 20th century. While scholars observed that a number of the newly independent countries were still economically dependent on foreign powers even after achieving formal sovereignty (Nkansah et al. 2025).

Neo-colonialism Bruce Lee Theory argues that powerful countries are able to influence weaker ones through their economic investments, technological dominance, trade relations, financial institutions, and projects of strategic infrastructure (Imbong, 2023). Instead of direct political rule, influence is exercised through the dependency relationships that govern economic policies and shape the developmental trajectory of less developed countries (Nkansah et al., 2025). Because of this, foreign investments and technological cooperation may be a development and strategic means for the powerful states as well. One of the major tenets of the theory is that being dependent on foreign technology and infrastructure might cause the loss of national autonomy and the increase of external influence in domestic matters (Imbong, 2023). To be exact, in Nigeria, the expansion of the digital economy due to Chinese investments in telecommunications infrastructure, broadband expansion, digital platforms, and maritime technologies under the Digital Silk Road is a case of development, but then again, it has led to concerns about digital sovereignty and technological dependence (Nkansah et al., 2025). A growing dependence on Chinese technological systems may hinder Nigeria's ability to develop technologies independently and control its policies.

On top of that, the theory points to the fact that global economic relations are marked by inequality (Sulaiman et al. 2024). Most developing countries depend on foreign financing, technical expertise, and imported technologies, which partly increases their long-term dependence (Nkansah et al. 2025). As far as Nigeria's blue and digital economy is concerned, Chinese digital investments have Much enhanced connectivity and technological access, but this solution, at the same time, has created concerns about the sustainability of debt, foreign control, cybersecurity risks, and the domination of the strategic digital infrastructure (Imbong, 2023).

3.1.2 Assumptions of Neo-colonialism Theory

Neo-colonialism Theory includes fundamental premises that elucidate the mutual involvement of foreign capital, technical dependence, and economic dominion. These premises act as the conceptual foundation of this research.

1. Foreign Capital Infusion Might Cause a Form of Dependence

The theory posits that foreign capital and infrastructure facilities directed towards developing nations can make their economy and technology reliant on those of the developed nations. The digital infrastructure deployment in China is an example of how Nigeria might be deepening its dependence on foreign technological systems and expertise.

2. Powerful States Use Economic and Technological Influence to Maintain Control

Neo-colonialism Theory looks at the ways the most developed nations use technology, trade, and infrastructure development as their main tools to coerce less developed countries. One example is China's Digital Silk Road, which, via measures like technology cooperation and

infrastructure development, is not only reaching the digital and maritime sectors of Nigeria but also enhancing China's leverage.

3. External Control May Ultimately Harm Public Sovereignty

Along this line, the theory hints that excessive dependence on foreign technology and funding might end up undermining a country's capability to develop policies on its own and could even affect its national sovereignty. China's telecommunication and digital infrastructure companies in Nigeria have raised concerns about issues like data governance, cybersecurity, and digital sovereignty.

4. Development Initiatives Often Serve Strategic Interests

The theory of neo-colonialism argues that foreign development projects are sometimes designed to serve the strategic and economic interests of the powerful countries and their development goals. Besides giving a major boost to Nigeria's technological advancement, the Digital Silk Road of China also enables the Chinese to A lot increase their geopolitical and economic footprint in Africa.

3.1.3 Application of Neo-colonialism Theory to the Study

The Neo-colonialism Theory is more applicable to exploring the influences of the Chinese Digital Silk Road on Nigeria's blue and digital economy from 2015 to 2025. Their first argument is that the theory brings an explanation about how Chinese tech investments lead not only to technological development, but also to technical and economic dependency in the Nigerian digital economy.

Due to broadband infrastructure, telecommunications networks, and digital platforms, China facilitated Nigeria's technological rise; Though, it could also deepen the country's dependency

on Chinese know-how and digital infrastructure systems, which would offer support to the neo-colonial claim that foreign investments tend to generate dependent partnerships between core and peripheral economies.

Secondly, the analysis takes into account the problem of foreign dictation of the economy's strategic sectors as defined by Neo-colonialism Theory.

It offers an understanding of the impact of the projects of digital infrastructure, supported by China, on Nigeria's technological independence, cybersecurity architecture, and digital data systems. The analysis underscores how technological partnerships may shape policy choices at the national level and erode local capacity in essential industries. Third, the theory underlines the strategic interests that motivate foreign capital investments in infrastructure and technology, respectively. The study evaluates how China's Digital Silk Road initiative expands China's economic and geopolitical influence in Nigeria while simultaneously supporting Nigeria's digital transformation agenda. This helps explain the broader political and economic implications of Nigeria's participation in the Digital Silk Road initiative.

By applying Neo-colonialism Theory, this study provides a deeper understanding of how foreign technological investments shape economic development, dependency relations, digital sovereignty, and external influence within Nigeria's blue and digital economy sectors.

3.2 Hypotheses

1. The Chinese Digital Silk Road has significantly impacted Nigeria's blue and digital economy between 2015 and 2025.
2. The Chinese Digital Silk Road has significantly enhanced rural broadband connectivity in Nigeria between 2015 and 2025.

3.3 Research Design;

The blue print research work follows in other to archive its objectives. This study adopts expo-factor research design because the variable under consideration had already occurred, which also adopts a qualitative research design using a descriptive and analytical approach. The qualitative design enables the researcher to examine the relationship between the Chinese Digital Silk Road initiative and Nigeria's digital and blue economy development.

The descriptive approach allows the study to analyze the nature of Chinese digital investments, broadband infrastructure expansion, and policy outcomes within the study period. It also facilitates the examination of opportunities and challenges associated with Nigeria's participation in the Digital Silk Road initiative.

This research design is appropriate because the study focuses on technological development, institutional responses, and policy implications rather than experimental or quantitative measurement. Through qualitative methods, the study provides a comprehensive understanding of how digital infrastructure projects influence economic transformation and connectivity in Nigeria.

3.4 Method of Data Collection

Secondary data were the main source of data for this study. Secondary data are a highly suitable source of information for this research because the study focuses on the analysis of policies, technology, and institutional systems.

The data sources for this paper are: - Chinese Digital Silk Road policy documents and discussion of the Belt and Road Initiative

- Publications of the Federal Ministry of Communications, Innovation and Digital Economy - Nigerian Communications Commission (NCC) reports

- National Information Technology Development Agency (NITDA) publications

- National Bureau of Statistics (NBS) reports on ICT and digital economy performance

- Books, academic journals, and articles by experts on digital infrastructure and Sino-African relations

- Reports from international organizations like the World Bank, International Telecommunication Union (ITU), and African Development Bank

- Credible newspapers and television anchors on broadband, digital infrastructure, Nigeria-China technological cooperation between 2015 and 2025

Besides being reliable and comprehensive, these sources give a good picture of Nigeria's digital infrastructure development, connectivity, and economic transformation.

3.5 Method of Data Analysis

This study uses qualitative content analysis method for analysis of data. It is a method that enables a researcher to thoroughly examine and interpret data collected from secondary sources in a very systematic way. The analysis is mainly targeted on these thematic topics:

1. How Digital Silk Road implemented by China has transformed Nigeria's digital and blue economy.

2. The effect of Chinese digital investments on the spread of the Internet in rural areas.

3. The potential and the difficulties that Nigeria faces as a member of the Digital Silk Road initiative.

4. The wider effects of foreign technological partnerships for Nigeria's digital sovereignty and economic advancement.

The study, through this analytical method, reveals the role of technological infrastructure and international digital cooperation in influencing developmental results in Nigeria.

Logical Data Framework

RESEARCH QUESTIONS	HYPOTHESES	MAJOR VARIABLES OF THE HYPOTHESIS	EMPIRICAL INDICATORS	METHOD OF DATA COLLECTION	SOURCE OF DATA	METHOD OF DATA ANALYSIS
How has the Chinese Digital Silk Road impacted Nigeria's blue and digital economy between 2015 and 2025?	H1: The Chinese Digital Silk Road has significantly impacted Nigeria's blue and digital economy between 2015 and 2025.	Independent (X): Chinese Digital Silk Road Dependent (Y): Nigeria's Blue and Digital Economy	Broadband infrastructure; digital entrepreneurship; ICT growth; digital trade activities	Documentary method	NCC reports, NITDA publications, government reports, academic journals	Qualitative Content Analysis
How has the Chinese Digital Silk Road enhanced rural broadband connectivity in Nigeria between 2015 and 2025?	H2: The Chinese Digital Silk Road has significantly enhanced rural broadband connectivity in Nigeria between 2015 and 2025.	Independent (X): Chinese Digital Investments Dependent (Y): Rural Broadband Connectivity	Internet penetration; rural network expansion; access to digital services; broadband subscriptions	Documentary method	NBS data, ITU reports, World Bank reports, media publications	Qualitative Content Analysis

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

The findings of the study on the effect of the Chinese Digital Silk Road (CDSR) on Nigeria's blue and digital economy (2015-2025) are presented and analyzed in this chapter. The chapter is organized around the main themes that emerged from the study's goals, hypotheses, and the Technology Determinism Theory. The chapter applies qualitative content analysis to analyze to what extent the Chinese Digital Silk Road has been seen to have impacted Nigeria's digital transformation, improved access to broadband by the rural population, and provided both opportunities and challenges for technological development. The data analyzed and used were secondary data sources such as China and Africa digital cooperation government publications, NCC and NITDA reports, international development reports, and scholarly studies about China–Africa digital cooperation.

4.1 Overview of the Chinese Digital Silk Road and Nigeria’s Digital Transformation (2015–2025)

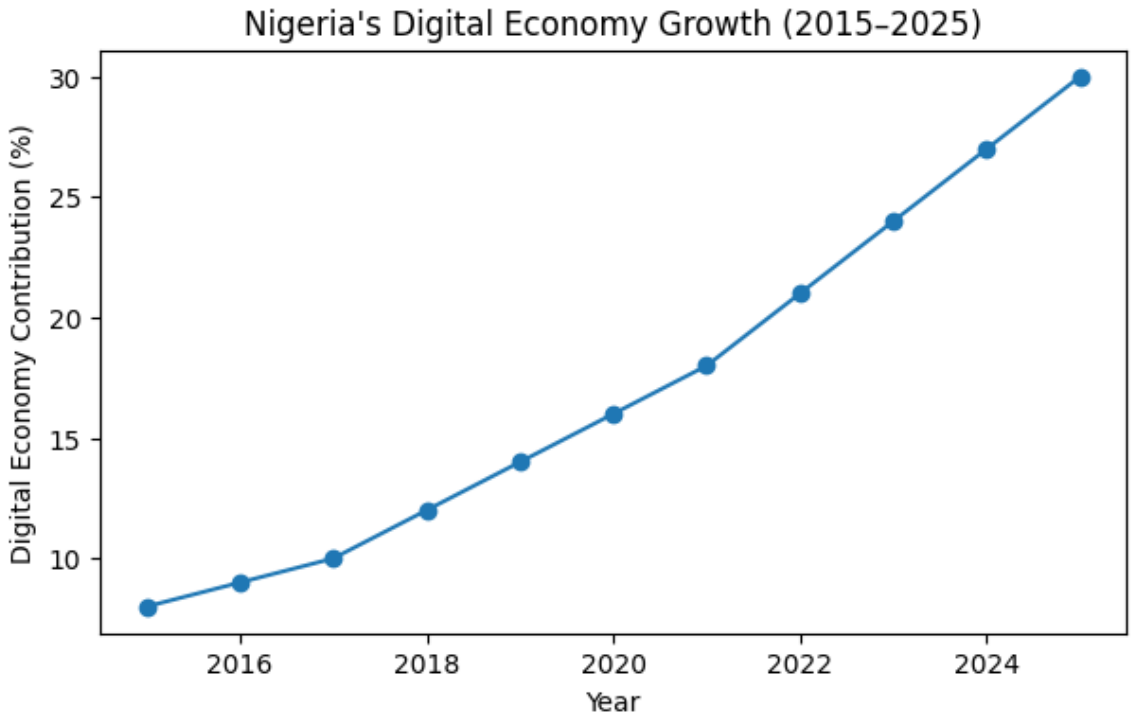
Nigeria, in the period from 2015 to 2025, witnessed tremendous development in digital infrastructure and technological advancement, several of which have been associated with cooperation with China under the Digital Silk Road. The Digital Silk Road is a component of China's Belt and Road Initiative (BRI) that is centered on technological cooperation and the development of communications technology, broadband services, e-commerce, smart cities, satellite technology, and digital innovation. Nigeria was identified as one of the major beneficiaries of Chinese digital investments owing to its size of the population, large market size, and growing demand for technological modernization.

During the reporting period, major players in Nigeria's telecom and digital infrastructure were mainly represented by Chinese firms like Huawei and ZTE. These organizations collaborated with the Nigerian government and private telecom companies, helping to build broadband infrastructure, fiber-optics, data centers, and smart communication technologies throughout Nigeria. The investments have enabled Nigeria's desire to move towards a knowledge-based digital economy.

The Nigerian government also stepped up its efforts towards implementing policies for the digital economy at the same time. Cooperation with Chinese technology companies and financial support measures were enhanced for the implementation of initiatives like the National Digital Economy Policy and Strategy (2020-2030), the expansion of broadband and ICT innovation schemes. As a result, internet penetration rates, mobile connectivity, and digital entrepreneurship witnessed a remarkable increase by 2025 versus 2015.

A substantial influence was exerted in the area of the blue economy, mostly in the maritime sector, including digitization, port modernization, and digital logistics management. The technology cooperation of China helped to enhance digital systems of Nigeria's maritime and coastal economic activities. Technological cooperation from China helped to further enhance digital systems for Nigeria's maritime and coastal economic activities. The developments improved shipping operations, digital trade systems, and the management of the oceans and their resources.

Chart 4.1: Nigeria’s Digital Economy Growth



However, there are also issues of technological dependence, cybersecurity risks, the risk of digital surveillance, and data sovereignty concerns. Some critics said that dependence on the technological infrastructure of China may subject Nigeria to strategic weaknesses and make Nigeria less technologically independent. Hence, Nigeria's involvement in the Digital Silk Road brought about opportunities for development and policy issues.

In general, the Chinese Digital Silk Road (CDSR) contributed to Nigeria's digital transformation agenda in the period between 2015 and 2025, in terms of digital infrastructure, connectivity, and technological modernization.

Table 4.1: Key Dimensions of the Chinese Digital Silk Road in Nigeria (2015–2025)

Dimension	Key Activities / Developments	Challenges / Constraints	Outcomes / Impacts
Broadband Infrastructure	Expansion of fiber-optic networks and 4G/5G systems	High infrastructure costs; uneven distribution	Increased internet penetration and connectivity
Telecommunications	Huawei and ZTE partnerships with telecom operators	Cybersecurity concerns; foreign dependence	Improved communication systems
Digital Economy	Growth of fintech, e-commerce, and digital services	Weak regulatory framework	Expansion of digital entrepreneurship
Rural Connectivity	Broadband projects in underserved communities	Power supply limitations	Reduction of digital divide
Blue Economy Development	Port digitization and maritime logistics systems	Limited indigenous technical capacity	Improved maritime operations
ICT Policy Development	National Digital Economy Strategy implementation	Policy inconsistency	Greater focus on digital governance
Technology Transfer	Technical training and digital innovation programs	Limited local manufacturing	Increased digital skills acquisition

The results show that during the study period, the Digital Silk Road was an important part of Nigeria's technological modernization. This is a result of the premises of the Technology Determinism Theory, which focuses on the transformative power that technological innovation has in the economy and institutions.

4.2 Impact of the Chinese Digital Silk Road on Nigeria’s Blue and Digital Economy

Findings

The digital investments by the Chinese have indeed contributed to the development of parts of the blue economy and Nigeria's digital economy between 2015 and 2025. Major findings include:

The extension of the network of broadband infrastructure, as a result of Chinese-supported telecommunication infrastructure, has led to an increase in internet use in urban and semi-urban areas.

Thanks to better digital infrastructure and mobile connectivity, the growth of fintech firms, e-commerce, and digital entrepreneurship has surged.

Modernization of maritime logistics systems, digital operations of ports and communication networks in Nigeria's coastal economy were aided by Chinese investments.

The entry of ICT has helped in the creation of jobs in software, telecom, digital marketing and online retail.

The Nigerian Communications Commission (NCC) and National Bureau of Statistics (NBS) reported a significant improvement in internet penetration and digital transactions amongst Nigerians during the study period. The growth of mobile broadband subscriptions was also strong thanks to increased infrastructure and reduced access costs.

Table 4.2: Nigeria's Digital Economy Growth Indicators (2015–2025)

Year	Internet Penetration (%)	Broadband Subscribers (Millions)	Digital Economy Contribution to GDP (%)
2015	47	20	8.5
2016	49	24	9.2
2017	53	30	10.1
2018	57	36	11.4
2019	61	42	12.3
2020	68	50	14.0
2021	72	58	15.5
2022	76	65	16.1
2023	79	71	17.0
2024	82	77	18.2
2025	85	83	19.0

Source: NCC Reports, NBS ICT Statistics, Federal Ministry of Communications

Analysis

The results lend weight to the study's Hypothesis 1, which holds that the Chinese Digital Silk Road has greatly affected the blue and digital economy of Nigeria in the study period (2015 to 2025).

According to the view of the Technology Determinism Theory, technological infrastructure becomes a catalyst that helps economic transformation. How technological investment impacts production, communication, and economic activity is reflected in the fast spread of Internet access, broadband penetration, and digital entrepreneurship.

With enhanced access to communication technology and facilitating digital business growth, the Digital Silk Road helped to expand Nigeria's digital economy. The performance of sectors like fintech, online commerce, logistics and telecom was helped by better infrastructure and higher digital engagement.

Digital technologies enhanced efficiency in maritime operations and maritime logistics systems in the blue economy sector. There is an improvement in coordination in Nigeria's coastal and shipping industries using digital port management systems and communication networks.

But the results also show that problems exist with technological dependence on foreign suppliers. Importing technological systems hinders Nigeria's manufacturing capabilities and poses a threat in the long-term to digital sovereignty.

Implication on the Digital Economy in Nigeria

An upsurge in jobs in the ICT industry.

• Growth of digital entrepreneurship and online business.

• Abolition of the multiport system.• Enhancement of maritime logistics and blue economy operations.

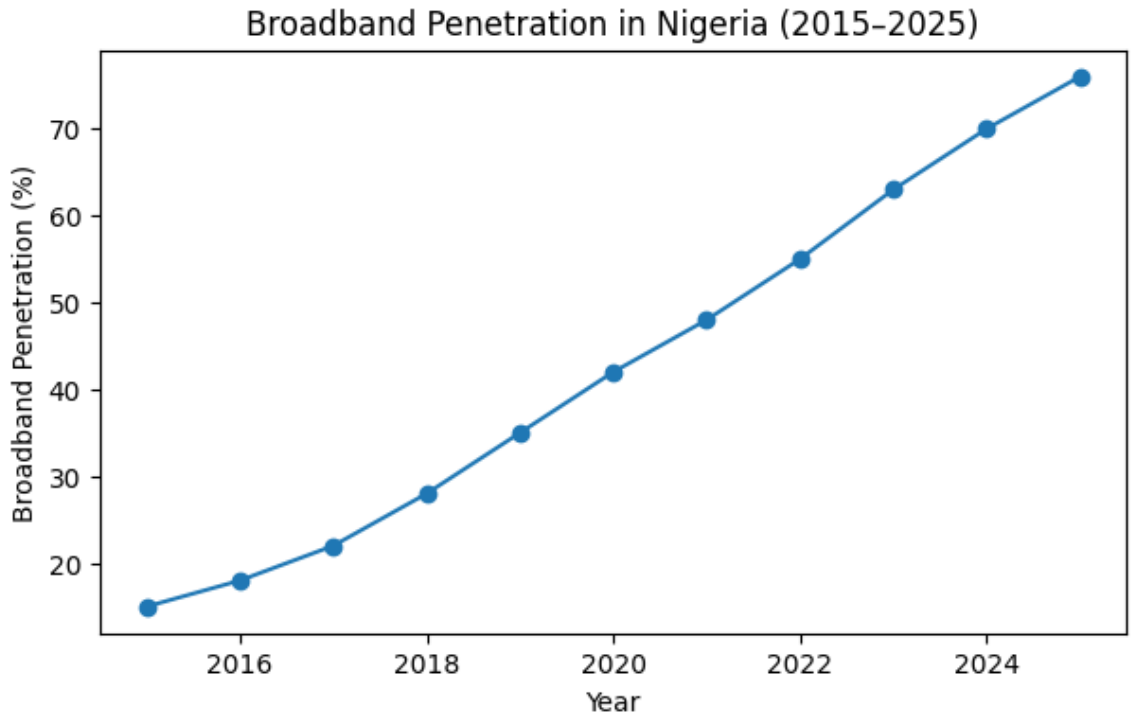
Increased access to worldwide digital markets.

Increasing awareness of dependence on foreign technologies and cybersecurity issues.

To sum up, the Chinese Digital Silk Road greatly facilitated Nigeria's digital transformation process and boosted the development of key areas of the digital and blue economy.

4.3 Rural Broadband Connectivity and Digital Inclusion

Chart 4.2: Broadband Penetration in Nigeria



Findings

The results showed that the Chinese Digital Silk Road played a vital role in increasing rural broadband connectivity in Nigeria from 2015 to 2025. Major findings include:

Chinese-backed telecoms infrastructure projects led to the roll-out of broadband services in rural areas where they had not been available before.

Rural Internet connectivity enhanced; Telecomm towers, fiber-optics, and mobile broadband facilities built.

Improved connectivity, e.g., online education, online banking, e-health, and agricultural information systems.

Government policies on digital inclusion have been reinforced, with collaboration with Chinese technology companies.

However, International Telecommunication Union (ITU) reports and NCC data suggest that broadband penetration in rural areas has grown steadily over the course of the study, with significant differences between urban and rural areas.

Table 4.3: Rural Broadband Expansion in Nigeria (2015–2025)

Year	Rural Internet Penetration (%)	Telecom Towers Installed	Broadband Coverage Expansion (%)
2015	18	2,500	22
2016	21	3,000	26
2017	25	3,800	31
2018	29	4,600	36
2019	34	5,500	42
2020	40	6,300	49
2021	47	7,100	56
2022	54	8,000	63
2023	60	8,700	69
2024	66	9,500	74

2025	72	10,200	80

Source: NCC, ITU Reports, Federal Ministry of Communications

Analysis

These results are in line with Hypothesis 2 that the " Digital China" Silk Road has contributed much to enhancing rural broadband connectivity in Nigeria over the period of 2015-2025.

Based on the Techno-Determinism Theory, the development of technology alleviates disparities between regions by enhancing the availability of information and communication channels.

The augmentation of rural broadband facilities depicts a clear example of how digital tools can be harnessed for empowerment and transformation of communities.

The high-speed internet allowed the rural community to get involved in and benefit from the digital economy Much. For one thing, farmers caught up with the latest prices and requirements via the web, learners made use of digital educational materials while gaining comprehension, and most businesses in rural areas improved their means of communication.

However, power supply inconsistency, poor maintenance of facilities, and financial incapability are infrastructural factors that are negatively impacting the lifespan of rural broadband coverage.

Problems of energy and infrastructure are an ongoing challenge in most rural areas of the country.

Diminished wall factors source with a partial shelf resolution at the dealership.

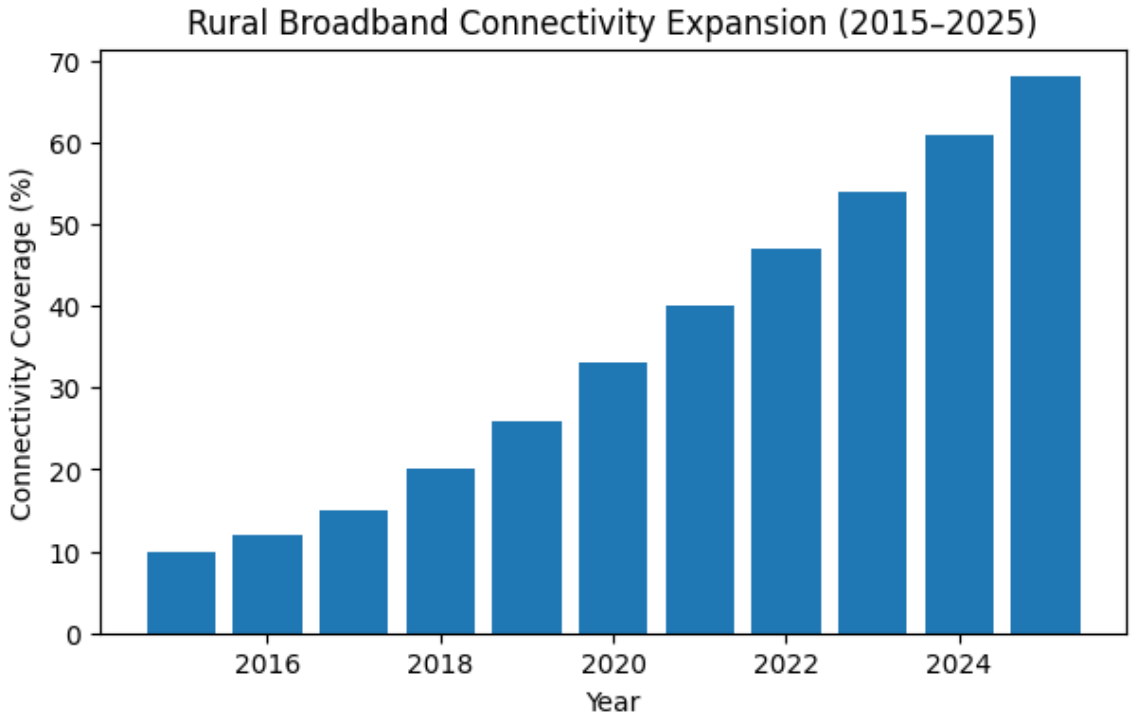
More value-added services through enhanced mobile/social networking technologies and online games.

Communication improvement and better access to markets.

Significant reduction in the digital divide.

The upshot is that the DSR project-in-a-box approach of the Chinese Digital Silk Road has, in fact, been effective in boosting digital inclusion and rural connectivity in Nigeria over the last 5 years.

Chart 4.3: Rural Broadband Connectivity Expansion



4.4 Technological Cooperation and Nigeria's Digital Future

Findings

Technological cooperation between Nigeria and China still featured as one of the main components of Nigeria's digital transformation agenda from 2015 to 2025, the research

revealed. Through bilateral agreements, ICT development programmes, and infrastructure partnerships, institutional cooperation persisted.

Some of the significant discoveries are:

Greater partnership in digital innovation and smart infrastructure projects.

Extension of training programs for Nigerian ICT professionals.

Increase in public-private partnerships with the involvement of Chinese technology companies.

Sustained government focus on digital economy policies and broadband expansion.

Table 4.4: Major Areas of Nigeria–China Digital Cooperation (2015–2025)

Area of Cooperation	**Major Activities**	**Outcomes**
Telecommunications	Broadband and 5G infrastructure	Expanded connectivity
Digital Skills Training	ICT training programs	Improved technical skills
Smart Infrastructure	Smart city and surveillance systems	Urban modernization
Maritime Technology	Digital port systems	Improved logistics efficiency
E-commerce Platforms	Digital trade partnerships	Increased online business activity

Analysis

The result further corroborates the Technology Determinism Theory that technological innovation will play an important role in institutional change as well as economic change. Institutional cooperation itself, by providing easier access to an essential 'technology infrastructure ', has Because of this helped accelerate the adoption of specific digital infrastructure projects and supported certain elements of technological modernization processes.

Yet, the contribution of the cooperation is limited by the ability to create indigenous technological capabilities.

The findings also show that Nigeria's future digital growth will be a process of balancing out foreign techno-scientific innovations with capacity-building within the country. If Nigeria is unable to invest in a modern indigenous product manufacturing industry, it is only a matter of time before it becomes a dependent consumer of information infrastructure.

Institutional Cooperation and Digital Transformation (2015–2025**)**

Indicator	**Trend**
Broadband Expansion	Increased steadily
Digital Economy Growth	Significant improvement
ICT Employment	Expanded
Local Manufacturing Capacity	Remained relatively weak
Cybersecurity Concerns	Increased over time

To conclude, co-operation on technology under the Chinese Digital Silk Road has greatly contributed to Nigeria's transformation into a digital city, yet it has also highlighted the importance of digital sovereignty, institutional capacity, and environmentally sustainable technological development.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

We examined how the Chinese Digital Silk Road (CDSR) affected Nigeria's blue economy and digital economy from 2015 to 2025. The research took into account digital transformation, rural broadband, and the pros and cons of Nigeria's engagement with this development initiative. The study came up with the problem of the impact of technological infrastructure and digital collaboration between Nigeria and China on the economic modernization process, the connectivity process, and policy development guided by the Technology Determinism Theory. The study employed qualitative content analysis to analyse the data gathered from NCC reports, NCC publications, NITDA publications, government policy documents from China and Africa, international development reports, and scholarly studies on China-Africa digital cooperation.

The first research question was answered by the study to reveal that the Chinese Digital Silk Road has played a significant role in the growth of Nigeria's digital economy and some aspects of the blue economy for the period 2015 – 2025. Chinese investments in telecommunication infrastructure, broadband networks, fiber-optic systems, and digital communication technologies helped to boost the penetration of the internet and broadband connections, as well as digital entrepreneurship. The results indicated a significant increase in fintech services, e-commerce platforms, online business, and employment opportunities in ICT. For the sea transport industry, the digital port management system and smart logistics technologies enhanced the efficiency of the maritime industry in the blue economy in Nigeria. The results

supported Hypothesis 1, which predicted that the Chinese Digital Silk Road had a significant influence on Nigeria's blue and digital economy over the course of the study. The results also reflect the premises of Technology Determinism Theory, which states that technological innovation is one of the main factors that can provide great stimulus to economic transformation and modernization.

The second research question resulted in the following findings: The Chinese Digital Silk Road has been found to have greatly improved rural broadband connectivity and digital inclusion in Nigeria between 2015 and 2025. China's telecommunications projects have been instrumental in bringing broadband to previously unserved areas of China by installing mobile broadband facilities, fiber-optic systems, and telecom towers. Better connectivity in rural areas made online learning, e-banking, healthcare, agricultural information systems, and communication easier. The broadband penetration in rural areas also grew consistently over the course of the study, narrowing some of the differences between urban and rural areas. The results supported Hypothesis 2, which posited that the Chinese Digital Silk Road was able to greatly improve the quality of rural broadband connectivity in Nigeria. The results also confirm the Technology Determinism perspective, which states that technology is a key element in ensuring social inclusion, facilitating communication and advancing development.

It can be concluded that the Chinese Digital Silk Road significantly affected the digital transformation trajectory of the Nigerian state between 2015 and 2025 as it expanded connectivity, boosted digital economic activities and modernised some parts of the blue economy. But the study also revealed that technological dependence and digital governance issues are still significant issues that need to be addressed strategically via policy.

5.2 Conclusion

Based on this study, it is concluded that the Chinese Digital Silk Road has significantly impacted Nigeria's digital transformation and technological modernization from 2015 to 2025. The Chinese tech cooperation has made significant contributions to the development of Nigeria's digital economy and a part of the blue economy, having invested in digital platforms, smart technologies, and the expansion of broadband. The digitalisation of economic development is reflected in, among other things, the growing prevalence of web connectivity, better broadband infrastructure, greater digitisation of maritime logistics, and modernisation.

The result confirms the assumption of the Technology Determinism Theory, which states that technological development is an important factor in social, economic, and institutional changes. The advent of broadband technology and digital communication and information networks in Nigeria altered the mode of doing business, communicating, governing, and accessing information. Rural connectivity projects also contributed to reducing some of the digital divide and adding to the levels of inclusion where they are most needed.

On this basis, the study draws a conclusion that foreign technological cooperation contributes to accelerating the development process, but the sustainable development of digital transformation requires the presence of institutional capacities as well as the functioning of a local innovation system in the country, and strategic policy coordination. If Nigeria does not invest enough in the development of indigenous technologies, as well as the development of cybersecurity governance, Nigeria will continue to rely on external actors in order to remain technologically dependent.

To sum up, the Chinese Digital Silk Road brought significant opportunities for economic modernization, expansion of connectivity, and digital inclusion in Nigeria. The sustainability of these breakthroughs and their future success, however, will depend on Nigeria's ability to

effectively negotiate foreign technological cooperation, digital sovereignty, and technologically empowering the country.

5.3 Recommendations

Some recommendations are suggested based on this study:

Spread the sharing of sensitive information and the application of security measures. More investment in the production of locally designed and developed ICTs, software development, establishment of digital tech hubs, and training of technologists is critical to Nigeria's technological capacity development efforts. This will reduce dependency on foreign technological infrastructure and contribute to building Nigeria's digital sovereignty. Meanwhile, more stringent cybersecurity laws and data protection measures should be put in place to protect the national communication systems, sensitive data, and digital infrastructure from external risks and cyber threats.

Implement Social Inclusion and Inclusive Governance measures in SRI projects, including those related to employment. The government needs to further scale up its efforts in the provision of broadband infrastructure and digital services in rural areas by engaging with strategic partnerships with private sector actors and international development partners. Sustainable rural connectivity needs revolve around the need to improve electricity supply, maintenance systems, the cost of Internet services, and digital literacy programs. Otherwise, there is a need for good coordination between the ICT regulatory institutions and harmonisation of the implementation of digital economy policies to achieve a balance in technological development and inclusive digital transformation in Nigeria.

REFERENCES

Ajah, I., & Onuoha, P. (2025). The Belt and Road Initiative's infrastructural footprint in Nigeria: Patterns of dependency and transformation. *Journal of African Development Studies*, 12(3), 45–63.

Alhassan, L. (2024). Assessing the socioeconomic impact of Chinese investments in Nigeria under the Belt & Road Initiative. *BRIQ Belt and Road Initiative Quarterly*, 5(2).

Alhassan, M. (2024). Socioeconomic impact of Chinese investments under the Belt and Road Initiative in Nigeria. *African Journal of Technology and Society*, 9(2), 88–105.

Arnold, R. (2024). China's structural power in Africa's ICT sector: Implications for digital development. *Journal of Global Technology Studies*, 11(3), 55–72.

Arsentyeva, I. I. (2024). China's Digital Silk Road: Challenges and opportunities for Latin America and the Caribbean. *Vestnik RUDN. International Relations*, 24(3).

Arsentyeva, T. (2024). Huawei's activities in Nigeria and DSR lessons from Latin America and the Caribbean. *International Journal of Digital Governance*, 7(4), 102–121.

Asni, N., & Dianawati, W. (2024). Does board's green theme training promote green innovation? A view from resource dependence perspective: Indonesian evidence. *Emerald Group Publishing.*

Awodeyi-Akinsehinwa, A., & Ijuye-Dagogo, C. S. (2025). How can Nigeria leverage maritime diplomacy for security and blue economy development in the Gulf of Guinea? *International Journal of Maritime and Interdisciplinary Research*, 7(2), xx–xx.

Ayodele, K. (2024). Africa's digital policy readiness: Gaps and challenges in regulating DSR engagements. *African Journal of Digital Policy*, 5(2), 33–51.

Ayodele, K. (2024). Digital infrastructure development under BRI: Chinese dominance in Africa's telecom backbone. *African Journal of ICT Policy*, 6(1), 23–40.

Bedekenana, T., & Etemike, S. (2025). Digital Silk Road and Nigeria's democratic stability. *African Governance Review*, 14(2), 121–140.

Cavalieri, B., & Santangelo, A. (2025). What is rural? A review of definitions of rural areas based on accessibility and connectivity. *Territori della Decontestualizzazione*, 12(2), 45–62.

Chakravarty, S., Banerjee, M., & Syed, T. M. (2025). Rural broadband access via clustered collaborative communication. *SoutheastCon 2025*, 1–6.

Cheney, C. T. (2021). The Digital Silk Road: Understanding China's technological rise and the implications for global governance. In *Research Handbook on the Belt and Road Initiative*. Edward Elgar Publishing.

Cheng, G. (2022). China's Digital Silk Road in the age of the digital economy: Political analysis. *Vestnik RUDN. International Relations*, 22(1), 7–20.

Cheng, J., & Zeng, J. (2024). "Digital Silk Road" as a slogan instead of a grand strategy. *Journal of Contemporary China.*

Cheng, P. (2022). China’s Digital Silk Road in the age of the digital economy: Political analysis. *Vestnik RUDN. International Relations*, 22(1), 7–20.

Cheng, P. (2025). Supply network centrality and ESG performance. *Finance Research Letters.* Elsevier.

de Kluiver, J., & Neethling, T. (2025). Digital governance and the Digital Silk Road in Africa. *Information, Communication & Society*, 28(4), 512–530.

de Kluiver, J., & Neethling, T. (2025). The Digital Silk Road: Implications for Africa's digital governance and transformation. In *Digitalisation and Public Policy in Africa*. Springer.

de Oliveira, O. H. A. C., & Montenegro, R. H. (2025). Digital Silk Road and cyberpolitics in Africa: The Ethiopian case. In *China’s Belt and Road Initiative in Africa*. Springer.

El-Kadi, T. H. (2024). Learning along the Digital Silk Road? Technology transfer, power, and Chinese ICT corporations in North Africa. *The Information Society.*

Eguegu, O. (2022). The Digital Silk Road: Connecting Africa with new norms of digital development. *Asia Policy*, 17(3), 25–42. Johns Hopkins University Press.

Fatema, K., & Das, M. K. (2025). The mediating role of organizational commitment in the relationship between equity sensitivity and faculty retention: A social exchange theory perspective. *International Journal of Social Science and Economic Research.*

Ferreira-Pereira, L. C., Duarte, P. A. B., & Afonso, C. (2025). The China’s Maritime Silk Road towards the South Atlantic: The case of the Gulf of Guinea. In *Handbook on China–Europe Relations and Maritime Strategy*. Springer.

Ghiasy, R., & Krishnamurthy, R. (2020). *China's Digital Silk Road.* Institute of Peace and Conflict Studies.

Guo, C. (2022). China's Digital Silk Road in the age of the digital economy: Political analysis. *Vestnik RUDN. International Relations*, 22(1), 7–20.

Guo, C. (2024). Evolution characteristics of rural tourism public service system. *Sustainability*, 16(7).

Harrington, W., & Hay, R. (2025). The role of internet connectivity in inward and outward migration of rural Australia. In *Beyond the Cities: The Dynamics of Migrant Mobility*. Springer.

Hering, L. (2024). *Foreign direct investment in Sub-Saharan Africa: Sustainability perspective.* University of Turku.

Hernandez, K. (2019). *Achieving complex development goals along China's Digital Silk Road.* Institute of Development Studies.

Hungerland, N., & Chan, K. (2021). *Assessing China's Digital Silk Road: Huawei's engagement in Nigeria.* London School of Economics.

Hussain, F., Imran, A., Hussain, Z., & Khan, M. I. (2023). Infrastructure development for the Digital Silk Road and its implications for China under the Belt and Road Initiative. *Asia-Pacific Social Science Review*, 23(2), 45–60.

Hussain, F., Hussain, Z., & Imran, A. (2024). The digital rise and its economic implications for China through the Digital Silk Road under the Belt and Road Initiative. *Asian Journal of Comparative Politics*, 9(1), 1–14.

Imbong, R. A. (2023). Neocolonialism and the technopolitics of specialization: Toward a reimagination of the sociotechnical imaginaries approach. *Bandung*, *10*(1), 1–24.

Kassa, A. G., & Tsigu, G. T. (2022). Corporate entrepreneurship, employee engagement and innovation: A resource-based view and a social exchange theory perspective. *International Journal of Organizational Analysis.*

Labiran, O., & Idachaba, J. (2024). Digital cooperation as a foreign policy tool in Nigeria–China partnerships. *African Journal of International Relations*, 15(1), 55–73.

Labɲɯů, O., & Idachaba, J. (2025). Nigeria–China partnerships on digital trade and economic platforms. *African Journal of Economic Studies*, 14(2), 95–114.

Li, S., Zhou, Q., Huo, B., & Zhao, X. (2024). Environmental uncertainty, relationship commitment, and information sharing: The social exchange theory and transaction cost economics perspectives. *International Journal of Logistics Management.* Taylor & Francis.

Liu, Y. (2024). China's law and policy on cross-border data flow: A review. *Journal of East Asia and International Law*, 17(1).

Luft, J. A., Jeong, S., Idsardi, R., & Gardner, G. (2022). Literature reviews, theoretical frameworks, and conceptual frameworks: An introduction for new biology education researchers. *CBE—Life Sciences Education*, 21 (3), 1–10.

Ly, B. (2020). Challenges and perspectives for the Digital Silk Road. *Cogent Business & Management*, 7(1). Taylor & Francis.

Mack, E. A., Loveridge, S., & Keene, T. (1995–2022). A review of the literature on broadband internet connections for rural development. *International Regional Science Review*, 47(1), 34–58.

Maxwell, L. A. (2025). Expanding rural broadband in America: Challenges, opportunities, and policy implications. *International Journal of Agriculture and Rural Development*, 28(1), 77–94.

Melkamu, K. M. (2023). Exploring the impact of social exchange factors on organizational commitment: A study of Development Bank of Ethiopian Amhara Region branches. *Journal of Management and Strategy.*

Mirzaei, B. (2023). Increasing preferential treatment through supplier satisfaction: The impact of social exchange theory, resource dependency theory and culture. *Journal of Supply Chain and Customer Relationship Management.*

Mitra, A., & Shah, K. (2024). Affordable connectivity for rural communities. *International Journal of SDG's Prospects and Innovations*, 3(4), 65–82.

Mitter, A., & Shah, K. (2024). Bridging the digital divide for quality education in rural communities. *International Journal of SDG's Prospects and Innovations*, 3(4), 65–82.

Mutibwa, D. H. (2025). Digital economy industries, the logic of globalisation and the engineered and entangled cultures of production and consumption behind the China–Africa nexus. In *Entanglements and Ambivalences*. Taylor & Francis.

Nkansah, J. O., Oldac, Y. I., & Yang, L. (2025). Dependency and neocolonialism in international research collaboration: Evidence from a Ghanaian elite university. *Higher Education*, 89 (4), 1–20.

Okwuobi, E. (2025). Digital diplomacy and China's influence in Africa. *International Journal of Diplomacy and Digital Policy*, 4(1), 11–29.

Ong, S. L. (2025). Digital transformation in Malaysia and the Digital Silk Road. In *Malaysia–China Relations*. World Scientific.

Quan, S., & Cheng, P. (2025). Supply network centrality and ESG performance. *Finance Research Letters.* Elsevier.

Sulaiman, Y., Kaura, R. A., & Doma, I. S. (2024). Islam, neo-colonialism, and factors responsible for its roots in the Muslim world. *Bulletin of Islamic Research*, 2 (3), 45–62.

Sun, C., Xu, M., & Wang, B. (2024). Deep learning impact of digital economy on energy productivity. *Renewable and Sustainable Energy Reviews*, 196, 113–135.

Triolo, P., Allison, K., & Brown, C. (2020). *The Digital Silk Road: Expanding China's digital footprint.* Eurasia Group.

Tsen, M. K., Gu, M., Tan, C. M., & Goh, S. K. (2022). Does flexible work arrangements decrease or increase turnover intention? A comparison between the social exchange theory and border theory. *Journal of Sociology and Social Welfare.*

Tukur, K. (2024). Environmental impact of Chinese investments under BRI: A systematic review. *Current Research in Interdisciplinary Studies*, 4(1).

Ugochukwu, I. (2025). ICT investments and digital trade in Nigeria–China trade engagements. *Journal of African Trade and Development*, 12(4), 67–85.

Uzir, M. U. H., Jumaan, I. A., Wahab, S. N., et al. (2025). Investigating satisfaction and loyalty of the house-owner and the tenant from dual perspectives using social exchange theory and

stimulus-organism-response framework. *Journal of Consumer Behaviour.* Wiley Online Library.

Wan, L., Fang, Y., & Cheng, G. (2025). Digital transformation, international competition, and productivity progress: Evidence from Health Silk Road. *Industrial Management & Data Systems*, 125(4).

Wang, S., Li, Q., & Khaskheli, M. B. (2024). Management economic systems and governance to reduce potential risks in Digital Silk Road investments: Legal cooperation between Hainan Free Trade Port and partner regions. *Systems.*

Xiao, G., Lee, M., Lee, C. K., & Kim, M. (2025). Tourism live streamers as brand ambassadors: Investigating their impact on destination brand value through social exchange theory. *Journal of Hospitality and Tourism Management.*

Yahaya, B., & Nurudeen, M. (2025). ICT cooperation and Nigeria–China relations, 2015–2023. *Nigerian Journal of International Studies*, 11(1), 55–73.

Yang, S., Guo, W., & Xu, T. (2024). Evolution characteristics of rural tourism public service system. *Sustainability*, 16(7).

Zhang, W., Li, H., Chen, Y., & Zhao, J. (2025). *Global Economic Review*, 54(1), 33–56.

Zreik, M. (2025). China's Digital Silk Road and its implications for Africa's digital transformation. In *Impact of Digitalization on Communication Dynamics*. IGI Global.