

A Theoretical Review of the State of Infrastructure in Africa

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Abstract

Infrastructure plays a vital role in the socio-economic development of every. A typical community cannot be sustained without setting up necessary and adequate infrastructure. However, one of Africa's most celebrated problems is the inadequacy of infrastructure. Also, lack of maintenance, management, and reconstruction has escalated the degeneration of available physical infrastructure. Based on this, the current study is aimed at understudying the state of infrastructure in Africa. The study reviewed archived literature on the deficits of infrastructure in Africa and how the deficits have been addressed over time. Findings from this study revealed that compared to other countries of the world, African countries lack adequate essential infrastructure such as road, rail, water and air transportation, as well as electricity and ICT facilities. Furthermore, even the available infrastructure are in a relatively bad state. African governments, international organisations, foreign governments, as well as the private sector have consistently invested funds to upgrade the state of infrastructure in Africa. However, localisation strategies must be employed in the development of African infrastructure in order to ensure that the essential infrastructural needs in Africa are being met.

Keywords

Infrastructure, Infrastructure in Africa, Infrastructural deficit, Infrastructure development.

1. Introduction

Infrastructure plays a vital role in every country's development, both socially and economically (Foster, 2010). Ofori (2007) contended that a typical community cannot be sustained without setting up necessary infrastructure such as roads, electricity, efficient water supply, and sewage disposal systems. Infrastructure encompasses the physical networking properties of urban areas that enable communication and interrelations between cities, regions, and countries. It allows for the easy flow of goods while linking and uniting people, irrespective of their backgrounds and beliefs (Graham and Marvin, 2001; Larkin, 2008). It is no longer news that Africa trails behind the rest of the developed world by a great margin in terms of infrastructural development as well as the standard of its construction industry.

One of the major problems of Africa is the inadequacy of physical infrastructure. Also, lack of maintenance, management, and reconstruction has escalated the degeneration of available physical infrastructure (Arewa, 2016). Provision of infrastructure has always been a global force behind economic growth and Africa should not be an exception. Failure to adequately address this infrastructural deficit will only accelerate the deteriorating living standards for slum inhabitants. This will affect general economic growth and as well increasing poverty (Giddings, 2007). Various factors act as a catalyst for infrastructure deterioration in Africa, namely insufficient funding, lack of technical ability and unavailable infrastructure inputs. These infrastructure deficits have a ripple effect on almost every area of national development (Arewa, 2016). The poor road network in Africa, for instance, can be directly linked to substandard and incomplete infrastructure and construction. Over the years, numerous African governments have prioritized modernisation and rebuilding towns into standard interlinked cities, which has greatly influenced Africa (Arewa, 2016). Infrastructure development significantly influences the fact that Africa is the fastest urbanising region in the world (Foster, 2010).

Based on the foregoing, the current study is aimed at understudying the state of infrastructure in Africa. This is with a view to assessing how strategies can be optimised to adequately address the infrastructural deficit in Africa.

2. Structure of the Paper

This study was conducted using systematic reviews from relevant literature published on the infrastructure in Africa. The paper is structured as follows; Section 1 constructed a background to the study which developed to highlight the aim of the study. Section 2 discussed the structure which the study followed. Section 3 discussed the effects of colonial activities on infrastructure in Africa. Section 4 extensively reviewed how the infrastructure in Africa are deficient. Section 4 also presents relevant data from archived materials on the deficit as road, rail, water and air transportation, as well as electricity and ICT facilities. Section 5 exposed briefly the strategies employed to address infrastructure problems in Africa as well as how they can be optimised for a better outcome. Section 6 summarized the lessons learnt from this study. Section 7 concluded the study.

3. Colonial Effects on Infrastructure in Africa

Compared to other countries of the developing world, African countries lack adequate essential infrastructure and even that which is available is in a relatively bad state. The poor state of infrastructure can be attributed to the effects of colonial activities (Arewa, 2016). For instance, the construction of infrastructure during the colonial era was primarily geared towards the needs of colonial powers. This meant that infrastructure and facilities such as roads were constructed to fit into the extractive plans of the colonial powers instead of being focused on the local network needs of the country (Settles, 1996). The European colonial powers developed an interest in Africa because of the presence of natural and mineral resources. Mineral resources such as diamonds and gold were the initial attraction until crude oil later took over. While countries in Central and West Africa were classified as resource rich, some other African nations such as Namibia, Zimbabwe, and South Africa also possess ample mineral deposits (Gwilliam, 2011:2).

Organisation patterns and the socioeconomic development of Africa which necessitate the construction of infrastructure are also a product of the effects of colonial activities (Hunt, 2014). The inadequacy of necessary infrastructure is a symptom of bigger issues in the pattern of socioeconomic organisation and development (Graham and Marvin, 2001). From an indigenous perspective, infrastructural projects carried out during the colonial era were not sustainable and could not be reproduced in the local environment. Such projects are usually executed with foreign materials and structured to meet foreign standards and needs which prove to be too difficult to be duplicated by locals with local materials (Foster, Butterfield, Chen and Pushak, 2008; Information Office of the State Council, 2013).

After the exit of colonial powers, the infrastructure available in Africa was inadequate to service developing economies and the rapidly urbanising populace owing to the foreign patterns and structures by which the infrastructure was initially constructed (Foster et al., 2008). As African countries attain independence, physical infrastructure begins to deteriorate owing to the inability to invest in the construction, development, management, and maintenance of infrastructure consistently and adequately. Consequently, the inadequacy of infrastructure in Africa accelerated after most countries attained independence (Arewa, 2016).

4. Infrastructural Deficits in Africa

Africa is faced with the problem of inadequate infrastructural facilities: this statement cannot be overemphasized. Numerous discussions have been ongoing for a long time concerning Africa's lack of sufficient basic infrastructure such as conducive residential living spaces for its citizen, stylish office complexes, tasteful shopping malls, suitable airports, good road networks and dependable electrical grids (Dollar, 2016:12; The Big 5 Construct, 2018). Rapid action is required to control rural-urban migration in Africa in order to avoid being internationally sidelined. African states must constantly seek to provide affordable and organized housing units as well as basic urban infrastructure that will adequately service the urban population (Giddings, 2007).

Since the demand for infrastructure is excessively greater than the supply, foreign investors took advantage of this shortfall as it poses a profitable means of investment. As a result of this, Africa has rapidly blossomed into a vast construction site with numerous buildings and structures being built within a short period of time. Consequently, as of 2012 seven of the world's ten fastest-growing economies were African (Deloitte, 2012; Arewa, 2016). These countries include the Congo, Ethiopia, Ghana, Mozambique, Nigeria, Tanzania, and Zambia (Jackson, 2012). Currently, at least six African countries are still on the top ten list.

Regardless of future projections, the economic growth of Africa is inhibited by underlying conditions inherent within many African countries. Two most essential but deficient characteristics of most African countries is the ability to create a suitable environment for sustainable development and economic growth (Arewa, 2016). At this point in history when the construction industry is being reinvented globally using innovative ideas and modern technology, the African construction industry needs to fully embrace modern construction technologies so as to perfect the development of Africa and bridge the gap between it and the developed world (Construction Industry Institute, 2008). One of the major challenges faced by construction professionals is the inability to incorporate alien 21st century innovations into the local construction industry. Also, foreign construction experts need to understand the local industry with the intention of tweaking innovations to conform to local construction needs so as to meet stipulated developmental goals (The Big 5 Construct, 2018).

Fixed millennium development goals are yet to be accomplished because of the incomplete construction of infrastructure which contributes consistently to the incessant poverty and volatility of most African countries. The modern-day partnership with China and other developed countries must be checked and filtered owing to past experience. However, the extent to which the partnership will facilitate full and complete infrastructure development is still uncertain (Arewa, 2016).

4.1 Transportation Infrastructure

Harris (2016) pointed out that there are seven African countries with better transportation infrastructure than the world average. These countries are all in North and Southern Africa. Figure 2.1 presents the index of transportation infrastructure quality in Africa.

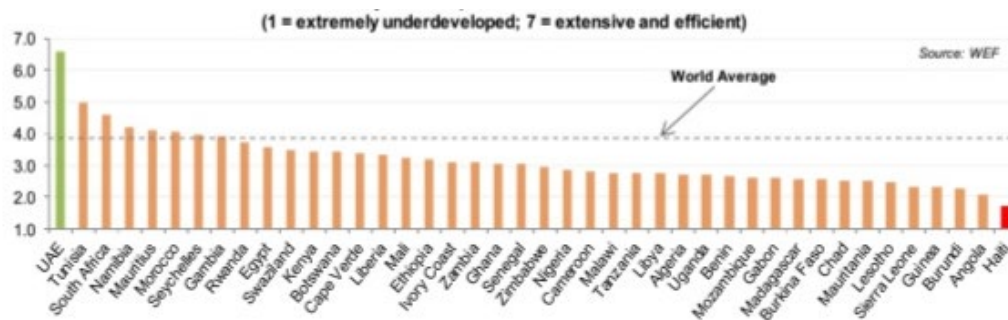


Figure 1: Quality of transport infrastructure in Africa

4.2 Road infrastructure

The rate of road access in Africa is approximately 34% which is relatively low when compared to the 50% world average. This has averagely doubled the cost of transportation in Africa (Delliote, 2012:1). Alves (2013:210) pointed out that access road infrastructure in Africa is most inadequate compared to the rest of the world. Africa possesses an average of 204 km per 1000 km² as opposed to the world average of 944 km per 1000 km². Studies carried out by Jedwab (2019:157) compared road infrastructure in Africa with other developing countries. For instance, the road density in Africa is less than one-third of that of South Asia. Furthermore, only 25% of the roads in Africa are paved as opposed to over 60% in India and 67% in China. Also, Sub-Saharan Africa possesses only 3700 km of highways: this figure is very low compared to 24000 km in India and 111,900 km in China (Jedwab, 2019:157). Harris (2016) pointed out that there are eleven African countries with better road infrastructure than the world average. Figure 2.2 presents the index of road infrastructure quality in Africa.

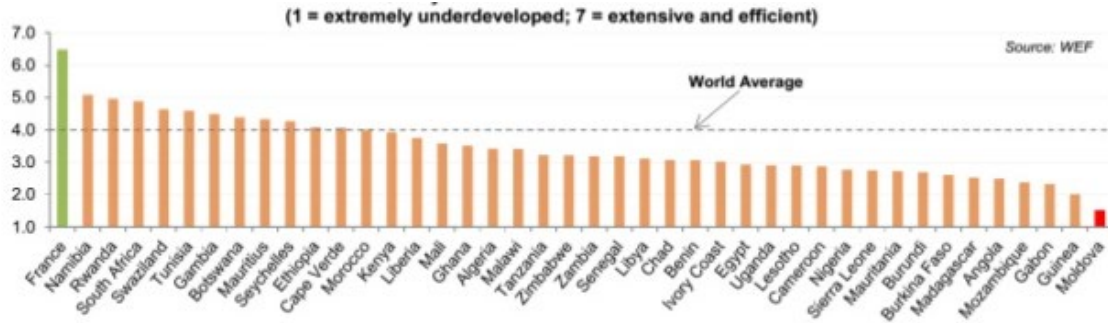


Figure 2: Quality of road infrastructure in Africa

4.3 Rail infrastructure

Africa can boast of approximately 55000 km of railways. With the exception of South Africa, most of the railways were constructed before 1970 and are barely rehabilitated. It is estimated that about 16 billion commuters per kilometre travel annually by rail in Africa. This figure is very low compared to 800 billion commuters per kilometre in India and China (Jedwab, 2019:157). Railway availability in the region is sorely deficient in relation to the demographic characteristics of the region (Alves, 2013:210). Harris (2016) pointed out that there are only six African countries with better rail infrastructure than the world average, namely Morocco, Tunisia and Egypt which are in North Africa, and Namibia, South Africa and Swaziland which are in Southern Africa. Figure 2.3 presents the index of rail infrastructure quality in Africa.

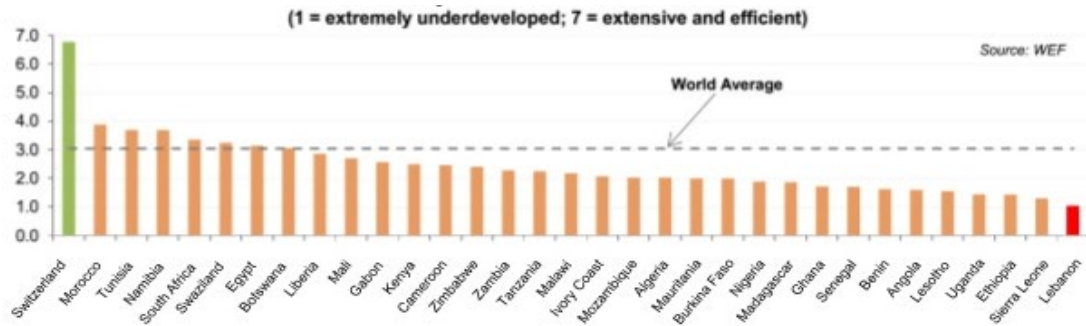


Figure 3: Quality of rail infrastructure in Africa

4.4 Water and air transportation infrastructure

The coastal line of Africa is well supplied with seaports. However, these ports are characterized by problems within their operations (Alves, 2013:210). Shaw (2015) pointed out that most seaports in Africa are beset by significant inefficiencies and inadequate capacity which are major hindrances to their smooth and effective operations. Map 2.1 shows the major seaport and airport hubs in Africa. Clear airport hubs are yet to emerge in West and North Africa with the exception of Nigeria and Egypt. Numerous opportunities are still available for the development of seaports and airports around Africa (Shaw, 2015).

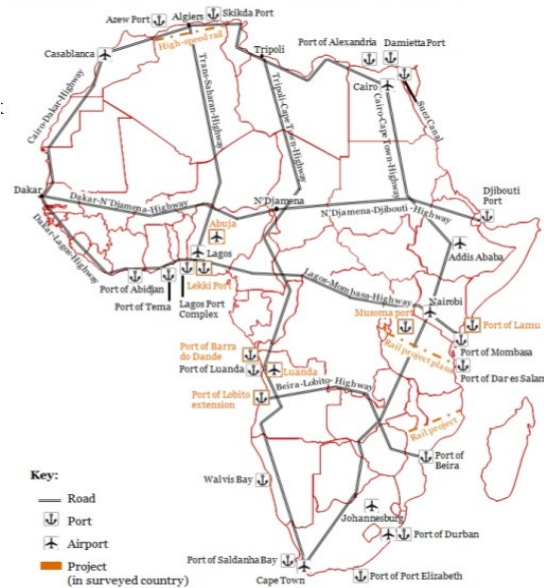


Figure 4. Major seaport and airport hubs in Africa

4.5 Power infrastructure

The World Bank indicated that the most significant deficit in Africa is electricity. It is reported that the electricity generation and supply in Africa approximately equals that of Spain. However, rough calculations place the population of Africa over 22 times more than that of Spain. Most parts of Africa are characterized by consistent power outages (Alves, 2013:210). Figure 2.4 shows the rate of electrification of African countries. From Figure 2.4, it can be deduced that only countries in North Africa have an approximate 100% electrification rate. Only North African countries as well as Seychelles and Cape Verde are above the world average.

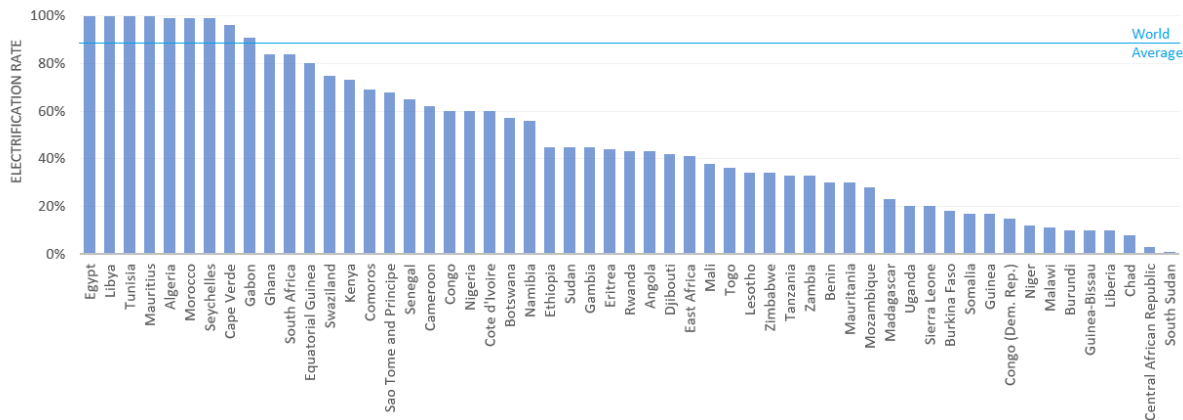


Figure 5. Rate of electrification of African countries

4.6 ICT infrastructure

On a more positive note, Africa is embracing the telecommunication infrastructure and possesses the fastest telecommunication growth rate in the world when compared to other regions. However, internet connectivity is still relatively very poor in Africa (Alves, 2013:210). Figure 2.5 shows the index of ICT development in Africa. There are only three African countries with better ICT infrastructure than the global developing countries' average, namely Mauritius, Seychelles and South Africa.

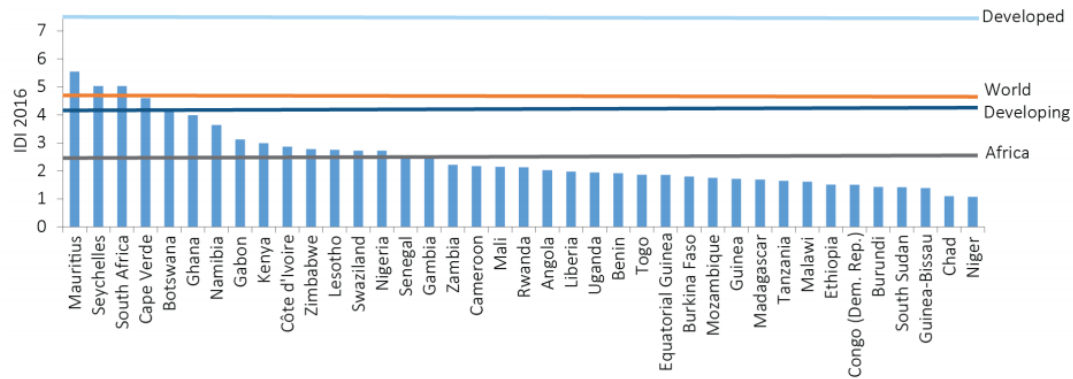


Figure 6. Index of ICT development of African countries

5. Addressing Infrastructural Problems in Africa

Alves (2013) reported that Africa still ranks very low in the provision of infrastructure. The situation of the infrastructure in Africa is degraded and particularly demoralizing in low-income countries. The most significant problem in Africa is that the investment in infrastructure does not keep the same pace as the population increase. This causes a huge deficit over the long term. Currently, most infrastructure still in existence are projects executed during the colonial era. A sizable portion of this infrastructure is neglected and therefore seriously degraded (Alves, 2013). The majority of construction firms in countries with emerging economies are controlled by construction firms from 'developed' or more 'developed developing' countries. These foreign firms in most instances only undertake major projects. It has become the norm for developing countries to accumulate a huge amount of foreign debt which severely decreases the rate at which the economy grows and infrastructure programmes are implemented (Adams, 1995). Adams (1995) also noted that numerous international organisations have taken significant interest in the growth and progress of local construction firms in developing economies, especially those in Africa. Organisations including the World Bank, the United Nations and the International Labour Office have been abundantly generous towards this cause. As a block of developing countries, Africa has become a desirable investment destination for numerous countries seeking economic cooperation. This desire emanates from the inherent deficits in Africa's infrastructure, inadequacy of capital, as well as a wide range of untapped resources (Alves, 2013).

Table 2.1 reveals the amount of finance that has been channelled as investments into addressing infrastructure deficit in Africa. It can be deduced from the table that African infrastructure consumes over US\$ 60 billion annually with an all-time high in 2013 reaching up to US\$ 99 billion.

Table 1. Financing flow into African infrastructure from 2012 – 2017 ('million US\$)

Donors into African infrastructure	2012	2013	2014	2015	2016	2017
African governments	42,197	46,674	34,500	28,402	26,255	34,345
Private sector	7,911	8,764	5,124	7,442	2,555	2,324
Europe	4,936	6,269	4,543	4,622	5,978	3,584
The Americas	1,321	7,155	693	1,002	140	311
China	13,360	13,443	3,091	20,868	6,413	19,403
Other Asian countries	3,713	2,451	2,693	2,380	3,570	3,075
African Development Bank	2,928	3,565	3,551	4,166	3,956	3,364
World Bank	4,370	4,533	6,480	6,039	3,642	6,993
European Investment Bank	1,813	1,077	1,015	1,414	1,250	1,889
Regional development groups	1,551	2,183	1,562	4,412	2,135	1,038
Arab Coordinated Groups	5,149	3,296	3,460	1,348	5,528	2,986
Others	-	-	876	1,278	1,078	2,235

Total	89,249	99,410	67,588	83,373	62,500	81,547
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Despite recent progress, the state of Africa's infrastructure is still very inadequate, and this is drastically affecting the investment and developmental potential for the region (Alves, 2013). Banks (2013:1) estimated the sum of US\$ 90 billion as the annual cost of meeting Africa's infrastructural needs from 2014 to 2023. This estimation includes funds for fresh investments as well as the maintenance and operation of completed ones. This makes it necessary for the governments of African countries to consider other funding sources that are profitable to its nations' economies. It is important to note that most countries in Africa lack the financial capability to undertake substantial developmental projects. However, several African countries are blessed with mineral resources which are being leveraged for infrastructural development (Alves, 2013).

With most developing African countries still struggling to bridge the massive gaps between urban and rural lifestyles, many opportunities are still available to China and other rapidly developing countries (Mason, 1989). More opportunities arise with about 80% of urban dwellers living in slums (Giddings, 2007). Sustaining urban centres requires endless development, construction and maintenance activities owing to the rapid population growth and urbanisation. This continual development is necessary in order to mitigate the impact on the environment and the population (Afolabi, Ojelabi, Bukola, Akinola and Afolabi, 2018). Effective management of a functioning city depends largely on the availability of adequate and standard housing and infrastructure. Making these facilities available can prove to be difficult as a result of funding and managerial problems in developing countries (Afolabi et al., 2018). However, various developed and rapidly developing countries, as well as financing groups, have led the charge to develop the infrastructure in Africa.

Contrary to popular belief, the localisation of infrastructure construction processes is essential. This will ensure that the basic knowledge and needs of the local environment are taken into consideration. An indigenous technical system could be established to enable the appropriate administration, upkeep and conservation of projects (Settles, 1996). Solving the problem of infrastructural inadequacy cannot necessarily be achieved by outsourcing the construction of those facilities to a foreign state (Blignaut, 2005); the problem can only be fixed by determining and addressing the root cause of the failed and incomplete state of existing infrastructure, as well as incorporating new initiatives into upcoming construction and infrastructural projects. Construction pattern and structure would be better optimized by taking into consideration the needs of the immediate environment and the impact every construction project will have on it (Arewa, 2016).

6. Lesson Learnt

Compared to other countries of the world, African countries lack adequate essential infrastructure and even the available ones are in a relatively bad state. The poor state of infrastructure can be attributed to the effects of colonial activities. Colonial developments in Africa were aligned to meet the needs of colonial powers. This meant that infrastructure such as roads and rails were constructed to fit into the extractive plans of the colonial powers instead of being focused on the local network needs of the country. The theoretical findings of this study showed that major infrastructure in Africa, such as road, rail, water and air transportation as well as electricity and ICT facilities are significantly deficient. The state of infrastructure in most African countries is way below the world average.

Optimising infrastructural development poses some difficulties as most African countries are still struggling to bridge the massive gaps between urban and rural lifestyle. Africa has become a desirable investment destination for numerous countries seeking economic cooperation. This desire emanates from the inherent deficits in Africa's infrastructure, the inadequacy of capital, as well as a wide range of untapped resources. In addition to African governments and private stakeholders, numerous foreign countries and international organisations has shown interests in optimising Africa's infrastructure. International organisations such as the World Bank, African Development Bank, European Investment Bank and countries like the USA, the UK, China, Japan have consistently invested funds in the development of African infrastructure.

However, solving the problem of infrastructural inadequacy cannot necessarily be achieved by outsourcing the construction of those facilities to a foreign state. The problem can only be fixed by determining and addressing the root cause of the failed and incomplete state of existing infrastructure, as well as incorporating new initiatives into upcoming construction and infrastructural projects. Construction pattern and structure would be better optimized by taking into consideration the needs of the immediate environment and the impact every construction project will have on it. Infrastructural development could be optimized by taking into consideration the needs of the immediate environment.

7. Conclusion

Infrastructure plays a vital role in the socio-economic development of every. Provision of infrastructure has always been a global force behind economic growth and Africa should not be an exception. Literature was reviewed on infrastructure in Africa and the African construction industry. The literature covered infrastructure, its importance, the colonial effects on infrastructure in Africa and to what extent infrastructure is deficient. Findings from this study revealed that compared to other countries of the world, African countries lack adequate essential infrastructure such as road, rail, water and air transportation, as well as electricity and ICT facilities. Furthermore, even the available infrastructure are in a relatively bad state. African governments, international organisations, foreign governments, as well as the private sector have consistently invested funds to upgrade the state of infrastructure in Africa. However, localisation strategies must be employed in the development of African infrastructure in order to ensure that the essential infrastructural needs in Africa are being met.

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Biography

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