

## **Skill Transfer in Sino-Nigerian Rail Transportation Partnership: A Quest for Sustainability of the Rail Sub-Sector in Nigeria**

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### **Abstract**

Due to a lack of indigenous engineering and funding, the moribund nature of the railway system in Nigeria facilitated the renewed interest in the Sino-Nigerian partnership largely framed by the Forum on China-Africa Cooperation (FOCAC) process and the Belt and Road Initiative (BRI) to develop Nigeria infrastructure. Consequently, despite the cooperation from China, through the Sino-Nigerian partnership, there is uncertainty surrounding the Chinese skills transfer to Nigerian rail workers toward sustainable maintenance of the Nigerian railway system. The paper explores the nature and level of skills transfer in the Sino-Nigerian rail transportation partnership. It ascertains the employment considerations vis-à-vis skills transfer in the rail transportation partnership. It also examined the challenges and hindrances of skill transfer in Nigeria's Sino-Nigerian rail transportation partnership. The descriptive research design was engaged through a qualitative approach. The approach relied on interviews as a form of primary data in sourcing relevant information from participants. Quota and purposive (with snowball) sampling techniques were used to select study participants. Content analysis was engaged for data analysis. The findings showed that non-technical workers were the major beneficiaries of Sino-Nigerian skill transfer through on-the-job training. Thus, the knowledge transfer was slower than expected, and the Nigerian engineers who were supposed to acquire the most important skills in the SGR project were not given the opportunity by the Chinese. The study concluded that there is an apt need for Nigeria to develop its indigenous technology that will be viable for long-term usage of the railway sub-sector without relying on external technology.

**Keywords:** *Partnership, Rail transportation, Skill transfer, Sino-Nigerian, Sustainability*



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### **INTRODUCTION**

Globally, the sustenance of modern infrastructure projects for improved economic conditions has been a Herculean task for most developing countries because of its inclusiveness, such as technical knowledge capacity, funding, indigenous initiative ownership, and consideration for local participation of people. In Nigeria, these requirements constitute great challenges for the country towards the attainment of the long-term sustainability of her infrastructure, especially in the railway transportation sub-sector. In essence, the long period of neglect in the railway sub-sector in Nigeria has led to rail infrastructural decline, which indicates a great setback for the viable economic transformation of people and the country. This dereliction in the sub-sector was compounded by poor infrastructure maintenance, a lack of rolling stocks, an unmotivated and aging workforce, and, of course, a lack of funding and expertise. The trajectory has slowed down not only the sub-sector but also contributed significantly to increased pressure on road transport with its attendant negative consequences and also to the dwindling economic situation of Nigeria. Thus, in the sociology of Nigeria as a people, the sustainability of the railway infrastructure project becomes a great concern as the country has not been able to indigenously retain projects indefinitely due to certain issues in the political economy of the country.

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Nigeria, a country with a population of over 200 million people, accounts for 16 percent of Africa's population (Ehizuelen et al., 2016). Nigeria's extant railway system is basically bequeathed to Nigeria from British colonial rule and is over a century year old. Relatedly, since the 1970s till date several foreign partners have been engaged by the Nigerian government to improve the moribund railway system toward the economic transformation of the country. First, the Rail India Technical and Economic Services from India were brought in to manage the Railway system in Nigeria. Second, a rail Construction Company from Romania was contracted to supply workshop equipment and wagons for the Nigerian railway development. Also, China Civil Engineering Construction Company (CCECC) was also contacted to rehabilitate the entire rail infrastructure from 1995 to 1997; but these projects in the railway sub-sector by the foreign partners were not effectively executed. This is apparent in the case of the Nigerian railway sub-sector, which lacks the required knowledge and modern technology to develop and maintain its railway infrastructure on its own. Thus, the lack of indigenous engineering capacity in the subsector encouraged a continued influx of foreign interventions in Nigerian railways with no sustainable outcomes.

In the recent economic reform, Nigeria relies on the partnership with China to bridge the gap in the infrastructure deficit, which further strengthened the Sino-Nigerian partnership. The renewed interest in the Sino-Nigerian partnership was largely framed by the Forum on China-Africa Cooperation (FOCAC) process and the Belt and Road Initiative (BRI) to develop Nigeria's infrastructure. The relationship is mainly based on infrastructure development in which about \$5 billion was invested by China through a loan from the Chinese Exim-Bank in Nigeria to develop the economy, especially in the areas of resuscitating and modernizing the railway infrastructure in Nigeria. Thus, Taylor (2007) and Mthembu-Salter (2009) affirmed that a Memorandum of Understanding (MoU) on the establishment of a strategic partnership was signed between Nigeria and China in 2006, where natural resources for infrastructure development became the key defining component of the agreement (Taylor, 2007; Mthembu-Salter, 2009). The term of the partnership agreement signed with the Chinese government, especially on the railway modernization project in Nigeria since 2006, apparently includes the counterpart funding of the rail project, technical training of the Nigerian rail engineers and workers, provision of rolling stock-coaches, locomotives, wagon, and transfer and localization of Chinese technology (Odeleye, 2000; Udeala, 2003; Kimairis, 2016).

Consequently, despite the cooperation from China, through the Sino-Nigerian partnership, there is uncertainty surrounding the level of skills transfer made available to the indigenous rail personnel by the Chinese in the ongoing rail projects in Nigeria. This is due largely to the antecedent of the Chinese in the rail construction projects in countries like Djibouti, Kenya, Ethiopia, and Uganda, where most of the pivot designs of the projects were executed by the Chinese experts and engineers without sustainable skills transfer to the host countries. A similar method is likely to be adopted in the SGR project in Nigeria. Thus, the sustainability of the rail sector in Nigeria becomes a major concern for the economic transformation of the country.

More importantly, critical concerns have been on the long-term effect of this partnership towards the sustainability of the railway infrastructure development in Nigeria. However, if the ongoing Sino-Nigerian relation is more of a partnership, what will be the fate of the country on the likelihood of conflict of interest between the two countries in terms of skill transfer and the

challenges it will have on human capacity development towards sustainability of the railway sub-sector in Nigeria? Several studies (Wang, Mao & Gou, 2014; Hurley, Morris & Portelance, 2018) have been on Chinese involvement in Nigeria and African infrastructural development and railway refurbishment. A consensus of these studies is of the position that China's infrastructural development in Africa is controversial and more of their own economic interest. However, these studies paid little attention to the sustainability of skill transfer in the Sino-Nigerian rail transportation partnership in Nigeria for long-term national development in Nigeria. Against this background, the paper explores the nature and level of skills transfer in the Sino-Nigerian rail transportation partnership and ascertains the employment considerations vis-à-vis skills transfer in the rail transportation partnership. It also examined the challenges and hindrances of skill transferrin Sino-Nigerian rail transportation partnership in Nigeria. The study created knowledge on the possible outcome of sustainability of skill transfer in the Sino-Nigerian rail transportation partnership in Nigeria.

## **LITERATURE REVIEW**

### **Maintenance Culture of Available Rail Infrastructure: Nigeria Situations**

The rail infrastructure development in Nigeria has been battling with a series of challenges in the sub-sector since its establishment in 1912 (Nigerian Railway Corporation, 2011). Studies have shown that about \$60 billion was invested in railway development by the Federal Government of Nigeria with limited improvement recorded in the sub-sector. The investment was for the connectivity of the major commercial centers within the country for economic development (Ford, 2004; Akunna, 2015). Importantly, Oxford Business Group (2016) revealed that Nigeria's railway system represents a vital cog in the country's transport infrastructure network, given the country's sizeable population and logistic needs. Thus, years of inadequate funding and poor maintenance have rendered much of the network unfit for use, forcing heavy freight onto the country's roads (Oxford Business Group, 2016).

Amba and Danladi (2013) affirmed that the cost of maintenance of the railway infrastructure is often highly capital intensive and is usually a real challenge because of the ways past governments in Nigeria had abandoned most projects in the railway sub-sector. The sub-sector is highly monopolized, and inadequate funding presents inevitable problems to the development of the railway sub-sector in Nigeria. Adesanya (2010) emphasized further on dwindling allocation to the rail transport subsector as a serious issue: lack of necessary resources to keep tracks, rolling stocks, and maintenance facilities in reasonable working conditions is said to have produced a serious deterioration of the railway system. These were further complicated by the widespread corruption and misappropriation of allocation to the subsector, especially the rail transport in the country. Okereke (2017) also decried the poor and underdevelopment intrinsic industrial base as a major obstacle in the railway subsector. He contended that this would have helped a lot in the maintenance and sustainability of the sector because most of the imported modern equipment and facilities from foreign partners are not fully utilized in the transportation sector. Thus, many commissioned infrastructures usually becomes subject to abandonment less than five years after being put into operation.

In context, it can be inferred that a development plan in any human society should be designed in such a way that external reliance would not have its way into the pattern and structure

of such plans. Resources at hand would be easily tapped to achieve certain programs, which might be difficult to achieve if it is to be sourced outside. Importantly, the lack of maintenance culture has become a bottleneck over time to the attainment of sustainable infrastructure development in Nigeria, which has affected many infrastructure projects after completion. Equally, this issue has generated concerns in the Chinese SGR projects in Africa. This has a serious implication for the sustainability of projects of such magnitude in Nigeria. Thus, the inability to procure raw materials needed for the accomplishment and maintenance of projects in Nigeria has been an obstacle to the realization of national development objectives.

### **Chinese Skill Transfers: Questions of Sustainability**

Prior studies (Corkin et al., 2008; Cheng & Liang, 2011; Wissenbach & Yuan, 2017) found that Chinese construction companies provide employees with on-the-job training focusing particularly on machine operation, trained local workers and facilitated local industrialization, but there has not been substantial technology transfer from Chinese investments to recipient countries. Similarly, Wang et al. (2014) asserted that there is limited transfer of skills and technology by the Chinese to host countries: the direct investment of the Chinese is targeted at enhancing local productivity and strengthening Chinese production, and also there existed non-alignment between the skills required and the work required to sustain operation in the host countries when Chinese supervisor is absent.

Chintu & Williams (2013) and Obiorah et al. (2008) raised the alarm about the operations of Chinese firms in Africa in terms of environmental and labour issues. It was affirmed that Chinese firms are known to employ more of their own citizens than the citizens of their host countries where unemployment is predominant. Issues of poor labour practices, harsh treatment of employees, low wages, and poor standards of corporate governance were raised. This was, however, attributed to poor environmental laws in China and a lack of adequate labour laws in host countries. This, in no small way, affects the level of skills and technology transferred to Nigerians by the Chinese company. Oyeranti et al. (2010) emphasize the Kajola Specialized Railway industrial free trade zone and Ogun and Lekki free trade zones which are part of the programme in place to sustain the project as an opportunity to transfer technology. It was said to have offered promising opportunities for Chinese and other investors eager to be closer to raw material sources and important markets in Africa. In context, the major concern remains the practicability of these beautiful ideas: as well as concrete evidence that these trade zones vis-à-vis infrastructure projects would operate effectively. Alden (2007) asserted that one of the hindrances to Chinese technology transfer to recipient countries is a language barrier since most of the equipment is usually labeled in a Chinese language manual that is not accessible to even the average educated Nigerian (Ehizuelen, 2017).

In context, Chinese investment in Nigeria's infrastructure and its operation has been viewed by analysts and several works of literature with skepticism. This is due to the complaint about the knowledge hoarding of the Chinese, which hindered the possibility of technology transfer to Nigerians. Furthermore, Nigeria as a nation is technologically deficient and may face a serious hurdle in how to sustain the technology which is meant for the sustainability of the infrastructure project in the country due to the unsustainable transfer of technical knowledge by the Chinese to Nigeria.

### **Theoretical Explanation**

This paper is framed by sustainable development theory. Sustainable development theory has its origins in the environmental movement and has acquired significance across all facets of human life, from social, to economic and political aspects (Odedairo et al., 2011). In essence, sustainable development theory focuses more on the goal of socially inclusive and environmentally sustainable economic growth (Sachs, 2015). Sustainable development theory identified information, integration, and participation as key building blocks to help countries achieve development that recognizes these interdependent pillars. It emphasizes that in sustainable development, everyone is a user and provider of information. It stresses the need to change from old sector-centered ways of doing business to new approaches that involve cross-sectoral coordination and the integration of environmental and social concerns into all development processes. Furthermore, the theory emphasizes that broad public participation in decision-making is a fundamental prerequisite for achieving sustainable development (Allen, 2007). In all, sustainable development theory affirms that development projects stand little chance of success unless the local population not only derives tangible and sustained benefits but are also actively involved in planning and control throughout (Simon, 1989).

In context, Nigeria is one of the most populous countries in the world, where ongoing rail transportation development will be of benefit to the general populace. Arguably, the resources needed to maintain such costly ultra-modern rail projects, such as funding, technical skills capacity, and monitoring, are not really available and accessible, which may have an adverse effect on the sustainability of the rail projects in the country. The theory further averred that new technology makes unanticipated resources available. In essence, the Chinese railway skills transfer in recent times was laced with the transfer of non-technical knowledge to the indigenous people in the country; instead of enhancing the indigenous skills through technical skills transfer, it made unanticipated resources available for the skills transferee. Apparently, Sino-Nigerian ultra-modern rail projects have so far not really encouraged cogent skills transfer in rail transportation, which is lacking in the country but has provided unanticipated resources to the Chinese. This has further enabled the intensification of unwholesome Chinese labour practices in terms of cheap labour with lower wage rates and limited participation of local skilled engineers in ultra-modern rail projects, which may not encourage sustainable outcomes for the transportation sub-sector. In all, sustainable development theory provides an explanation of the dynamics of the operation of the Chinese SGR on railway projects in Nigeria. Notably, this theoretical explanation is situated within the issue of Chinese skills transfer to Nigerians, which could be a marker in sustaining the rail project.

### **RESEARCH METHOD**

The study employed a qualitative design and used primary data sources. Lagos, Ogun, Oyo states, and Federal Capital Territory, Abuja, Nigeria, were selected for the study using a purposive sampling technique based on the fact that the Sino-Nigerian railway infrastructure was currently being executed in these areas. The data were sourced through the conduct of In-depth Interviews (IDIs) and Key Informant Interviews (KIIs). An in-depth interview is a qualitative method that is conducted for a few selected individuals with a relevant understanding of the subject of the research, while a key informant interview is also a qualitative method that relies on a guide in a

one-on-one interaction that enables the researcher to have first-hand information about a specific community or organisation from key community leaders and professional who is familiar and understand the culture and patterns of behaviour in the settings without thinking them (Erinosho et al., 2002; Newman, 2007). The IDI sessions were conducted for 17 participants (four Principal Officers and five technical officers of Nigeria Railway Corporation (NRC), and eight non-technical workers) through quota sampling technique in the selected states, while KIIs sessions were conducted with four informants (Officials of Ministry of Transportation in charge of Railway sub-sector) through purposive sampling technique in Abuja (Federal Capital Territory) totaling 21 participants. The sample size of the participants was limited in number due largely to the sensitive nature of the study, data management constraints, and hindrances of accessing all sample participants, which make it not feasible to employ a large sample size for the study. Data collected were subjected to content analysis using a thematic approach. Transcripts of the interviews were read carefully to gain a general familiarity with the participants' narratives. The coding process was done using the deductive approach in line with the study objectives, that is, assigning word by word, finding the keywords, grouping the quotes, and determining the final based on the codes and quotes. In all, the code/ quotes were reviewed and reduced into smaller categories, as reflected in the analysis section. For ethical considerations, verbal consent from the participant was obtained, and they were assured that they would not come to any harm as a result of their participation in the study.

## **FINDINGS AND DISCUSSION**

### **Findings**

Data obtained from the fieldwork of the study were analyzed, interpreted, presented, and discussed. The discussion was done in line with the focus of the paper.

### **Skills Transfer in Sino-Nigerian rail transportation Partnership: Nature and Level**

Findings from the participants indicated that Nigerian railway personnel and workers have benefitted in terms of skills transfer from the Chinese CCECC in charge of the Lagos-Ibadan Standard Gauge Railway modernization project in Nigeria. Findings showed that rail workers in the SGR project in Nigeria acknowledged that they received on-the-job training from the Chinese expatriates in a different area of specialization related to the SGR project in the country, which has improved their knowledge capacity in the railway system:

"...We gained a lot from the Chinese CCECC and for me as a person...Chinese do not believe that you have knowledge in one area; they trained us in different areas relating to railway works" (*IDI, Male, 31 years, Foreman, Non-technical Worker, Lagos*)

The assertion by the above participant was an indication that the Chinese opened up their knowledge of rail track and rail mould construction to Nigerian personnel. This means Nigerian personnel may, in the long run, be able to maintain the rail and sustain it at this level of skills, but their ability to do this may depend on whether other levels of Nigerian personnel were able to acquire the skills they were meant to acquire from the project.

Similarly, findings also showed that the nature of skills transfers from the Chinese expatriates to Nigerian personnel, according to the government officials, were in areas of rail design, survey to the construction of the SGR tracks in the country. In essence, apart from the on-the-job training of the local personnel, there is also local content and training of NRC personnel and Engineering Students of one of the Nigerian Universities in China to learn more about railway-related skills. One of the principal officers of NRC acknowledges that instructions were given to the Chinese CCECC on the need to adhere strictly to the transfer of skills to Nigerian rail personnel:

“The Nigerian government is always mindful of 40 percent local content in terms of manpower skills in every project in the country. This indicated that 40percents of the Nigerian people must be engaged in any projects in Nigeria, which we make sure the China CCECC adheres strictly to. We have NRC personnel and Engineering Students of Ahmadu Bello University, Zaria, Kaduna, in China, learning about railway-related skills” (*IDI, Male, 58 years, Principal Officer, NRC, Lagos*)

This response portrays the government's perspectives of the project, which looks good and is beneficial for the sustainability of the project after the Chinese rail experts might have gone. However, the assertion by the above participant depicts what is on paper, which may not be the same when it comes to implementation and reality. This is why it is difficult to say that, based on this perspective, one is sure that the Sino-Nigerian partnership in the rail sector will be sustainable. Also, there is a question, if this partnership will ensure skills transfer to sustain the project, why would the Nigerian government send students of a Nigerian University- ABU Zaria to go to China to learn about railway-related skills again? A very crucial issue in the political economy of the country. One can now comfortably ask - what was the criterion and what was the rationale? These skills transfer issues are already being influenced and coloured by Nigerian politics, thereby putting a big question mark on the sustainability of the Nigerian railway sub-sector through the Sino-Nigerian partnership.

Also, findings showed that in ensuring that relevant skills in railway infrastructure modernization were transferred to Nigerian rail personnel by the Chinese in the country, foreign consultants were engaged by the Nigerian government for routine inspection on the quality of works done and level of skills transfer to the Nigerian rail personnel at the SGR project site. This was further explained in the excerpt of one of the principal officers of the Ministry of Transportation in Nigeria:

“We have a consultant from Europe that compare the Chinese standard with the western world by inspecting what the Chinese are doing at the site of the rail project. They make sure the Chinese transfer their skills from design and survey to the construction to the Nigerian personnel at the site of the rail project in the country.” (*KII, Male, 49 years, Principal Rail Officer, Min. of Transportation, Abuja FCT*)

As earlier mentioned, these officers in their office have this rail project and its benefits all worked out, but this may not be effective in reality. A European consultant was employed to ensure that the Chinese transferred their skills to Nigerians. The possibility of this is not clear because it is very

difficult for European consultants to force the Chinese to transfer their technology if they decline to do so. Nigerian government should also know that the European consultants are here for the money and not necessarily in the Nigerian interest. The problem of the difference between what is on paper and what obtains in reality comes to the fore, as explained above.

Findings also showed that the nature of skills transfer by the Chinese expatriates to Nigerian rail personnel restricted the Nigerian rail engineers with limited participation in the SGR projects without any active role. Although, the engineers participated through observational learning from the Chinese expatriate during the rail survey to the track laying of the SGR project in the country. Also, in spite of the learning process given to the Nigerian rail personnel, the process seems to be slower than expected because most of the Nigerian rail personnel were not fully integrated into the core aspect of railway infrastructure-related skills: This was further explained from the excerpts of a participant that:

“When the Chinese CCECC started the rail survey, some of the engineers in NRC were sent to the SGR project site to learn about it and also during the rail formation, that is, the track laying before we returned back to NRC. The Chinese used modern technology to lay the tracks, which is one of the knowledge our engineers do not know but manually, we know how to lay the track. NRC does not have the machinery employed by the Chinese, so it is difficult to do it without having the technology used by the Chinese.” *(IDI, 55 years, Rail Engineer, Principal Technical Officer, NRC, Ibadan)*

This comment by the above participant has exposed a real problem in the sustainability of the rail sub-sector in Nigeria. Based on the assertion made, the Chinese seem not to be ready to really transfer their technology to Nigerians. In context, the big question is why is it that the Nigerian engineers are not fully being carried along because that is the group that is most important in this skill transfer if truly Chinese have the intention of transferring these skills. It looks as if something is missing here, that is, the issue of revitalizing Nigeria's indigenous technology. This is the only one we can be sure of at any time. From what the above participants described, Nigerians may result into learning these haphazard skills and may end up not utilizing them, which will translate to the rail sub-sector not being sustained amidst the huge debt. This put a dent in the dream of this project sustaining the railway sector in Nigeria. This raises huge concerns about the political economy of Nigeria in terms of policies, projects, and issues of maintenance and sustainability.

“We learned slowly from the Chinese about railway infrastructure development; we have not been allowed by the Chinese to drive the newly acquired SGR locomotives; we just sat beside them when the train was in motion. We were told we would still be trained on how to drive it, and that does not mean I cannot drive it successfully if called upon to drive it.” *(IDI, Male, 37years Locomotive driver, Non-technical Worker, Ibadan)*

The response of the above participant showed that the issue of skills transfer from Chinese to Nigerians is very intricate, and it appears that the Chinese may not be so willing to transfer this



skill. From the look of things, Nigerians are not allowed to practice even driving the train, and practice makes someone perfect. In essence, most Nigerians may not achieve anything by watching the Chinese because Nigeria as a nation does not encourage initiative and indigenous technology.

### **Skills Transfer in Sino-Nigerian rail partnership: Employment Considerations**

Findings on employment consideration in relation to skills transfer made possible by the China Civil Engineering Construction Company (CCECC) to Nigerian railway personnel indicated that non-technical rail workers were significantly engaged in the SGR projects in the country. The participants contend that the majority of the technical personnel were Chinese engineers and Nigerian local rail personnel as non-technical workers. One of the participants claimed that despite the fact that Nigerian rail engineers were given a limited role in rail projects handled by CCECC in the country; significant numbers of Nigerians had been engaged as non-technical workers in the SGR project:

“...It is only in the laying of tracks that Nigerian people were considered for employment in the ongoing rail project in the country. I heard from a Chinese man on the rail project site that they have employed over 6,000 Nigerians on the ongoing rail projects, but they are just labourers, and not engineers. Although the Chinese sometimes consult some of us that are senior engineers in NRC, we were not really engaged in the ongoing rail projects.” (*IDI, 55years, Rail Engineer, Principal Technical Officer, NRC, Ibadan*)

The response above exposed the suspicious handling of Sino-Nigerian partnership relations. This is due to the fact that subjecting Nigerian engineers to consultancy is another way of reducing the cost of production and thereby making more profits in the relationship. In context, this raises a huge concern about the sustainability of the railway sub-sector in Nigeria because unskilled workers may not have much to contribute to designing and constructing train tracks. They can only be useful in minor maintenance tasks, and that does not translate to the transfer of technology. Again knowledge acquisition is not limited to on-the-job training: as a matter of fact, the best method of knowledge transfer is the one attained through workshop training. Similarly, the economic advantage of not transferring skills is based on the fact that to sustain the project in the long run, Nigeria would still rely on the Chinese construction company to maintain the project. This perpetuates reliance on the Chinese and unsustainable outcomes for growth and development in the Nigeria railway sub-sector.

Some of the participants submitted further that Chinese expatriates were the ones handling the technical aspect of the SGR projects with local Nigerian personnel as non-technical rail workers:

“...Majority of Nigerian workers are employed as labourers and not as an engineer in the SGR project in the country.” (*IDI, Male, 31years, Foreman, Non-technical Worker, Lagos*)

This was further explained in the excerpts below:

“Most of the technical staff in the ongoing SGR are mainly Chinese and the Nigerians were just engaged as labourers. Chinese are the ones handling the major works here.” (*IDI, Male, 37years Locomotive Driver, Non-technical Officer, NRC, Ibadan*)

“Chinese CECC employed both skilled and unskilled workers in the rail project. Mostly, they engaged unskilled workers.” (*IDI, Male, 36 years, Welder, Non-technical Worker, Lagos*).

The above assertions indicated that the Chinese were more in an advantageous position than Nigeria in this relationship. Chinese takes the lead and make cogent decisions related to employment. The educated Nigerians were not allowed to take centre stage in the implementation of the partnership. Similarly, it could be deduced from the assertion above that those consulted among the engineers may be needed to provide them with necessary information about social and cultural challenges that may ensue in the process of construction of railway infrastructure in the country. The skills transfer to the Nigerians, which are surrounded by the knowledge monopoly of the Chinese, is a serious concern and sufficient enough to doubt the reality of this project. Also, since the consideration of Chinese skills transfer is centred on non-technician workers, what is the purpose of the project? Can non-technical design a rail system? What kind of skills are the Chinese trying to transfer?

#### **Skills transfer in Sino-Nigerian rail partnership: Challenges and Hindrance**

Findings indicated that there were certain challenges that were associated with the Sino-Nigerian partnership in the railway sub-sector, especially in terms of skills transfer to the Nigerian rail personnel. These challenges, according to some of the participants interviewed in this study, include lack of essential modern railway technology, non-availability of railway track materials, lack of essential welfare package from the Nigerian government, corruption among those in authority, and refusal of the Chinese rail expatriates to transfer core aspect of railway infrastructure skills to Nigerian rail personnel. Illustrating this further, a non-technical worker in the Lagos-Ibadan SGR project in Nigeria contends that if these challenges persist, it will make the sustainability of the rail project be relegated to the background because the Nigerian government will depend on the Chinese for maintenance of the modernized SGR in the country. In his descriptive expression, he lamented that:

“...There are skills that the Chinese CCECC did not make available to us in terms of overhead bridge rail tracks, which are not easy to construct. Well, they may do that to retain their superiority in rail transportation expertise over us...also, non-availability of railway materials because the rail metals used for this SGR is different in size and quality from the one we have here because the majority of the rail metals were imported from China. The problem is when the rail track is faulty; it will be difficult to replace it with the exact rail metal on the tracks. Then we would have to call the Chinese again to repair and fix it, which is not good for the country” (*IDI, Male, 35 years, Rail mason, Non-technical Worker, Lagos*)

The above expression indicates that technology-deficient nations would continue to struggle to catch up with the advanced nations due to overreliance on knowledge acquisition. In the case of the Sino-Nigerian partnership, lack of technical know-how is the initial reason for the relationship between the Chinese CCECC and the Nigerian government. If Nigeria as a country has the

technological wherewithal to construct a railway project and sustain it, there would not be a need to approach the Chinese. The technical knowledge, which could have led to localized spare parts, construction of railway lines, and building of locomotives, is lacking, hence, the reason for relating with the Chinese rail expatriates. Apparently, despite reaching an agreement on knowledge transfer, all indications show that the partnership may eventually not yield a positive outcome for Nigeria. This is due to the fact that the advanced societies will continually perpetuate their dominion over the developing countries, which seems more of a personal interest in the case of this partnership.

The findings were also illustrated further by one of the participants that Chinese technology deployed in the construction of SGR tracks in Nigeria may be a challenge in terms of accessibility for sustainable outcomes of the modernized SGR in the country:

"I do not think Nigeria can easily get the kind of equipment that the Chinese possessed. What may hinder Chinese skills transfer to Nigeria is the non-availability of essential railway technology because we lack knowledge on "turnaround," that is, the digital changing of rail lines. This should have been possible for a long time, but corruption among those in authority and fear of retrenchment among the NRC workforce have made the improvement of technology in railway impossible." (*IDI, 55years, Rail Engineer, Principal Technical Officer, NRC, Ibadan*)

The assertion above stated that knowledge transferred is impeded by the non-availability of essential equipment to Nigerians, which the Chinese are using. The rail materials and technology engaged for the SGR project are imported into the country, most of which are alien to Nigerians. In essence, Nigeria as a nation, despite huge investments in science and technology over the years, remained technologically deficient, lacked technological know-how, and was not adequately prepared for incoming change, which could lead to the retrenchment of the rail workforce. It should be noted that real change often goes with a substantial level of pain, the situation, which could hinder the transfer of skills by the Chinese CCECC.

Specifically, one of the non-technical workers illustrated further that comparatively, the Nigerian government paid little emphasis on the welfare of their personnel, unlike the Chinese in the SGR modernization project, which is a challenge to learning the methods and techniques employed by the Chinese rail expatriates:

"...The level of neglect on welfare for the indigenous railway workers by the government in the ongoing rail project is very bad, and the government needs to work on this aspect. The Chinese really take good care of their expatriates than we do on our own personnel in the ongoing SGR projects." (*IDI, 42years, Iron bender, non-technical worker, Ibadan*)

This is also borne out in the expression of one of the participants that the language barrier in terms of the mode of communication between indigenous rail workers and the Chinese rail expatriates, has been a major challenge of the Chinese skills transfer:

“I believe the lack of funds and the language barrier between rail workers and Chinese expatriates can hinder the transfer of skills from Chinese to local Nigerian personnel in the SGR project. This is because we could not understand what the Chinese were saying when they gave us directives at the rail site.” *(IDI, Male, 31years, Foreman, Non-technical Worker, Lagos)*

As indicated by the participant's expressions, knowledge transferred is hindered by the level of welfare enjoyed by the workers at the site of the rail project. Thus, the relationship between the Nigerian rail workers and the CCECC expatriates might be marked with low self-esteem, which might affect the assimilation of knowledge on the SGR project. The above expressions also elucidate the importance of language in the process of communication. Social relations are guided by the communication process, which could either be oral or symbolic. Arguably, transferring skillful knowledge vis-à-vis railway infrastructural design and construction requires an understanding of the oral conversation. Consequently, the Chinese language is difficult for most rail workers to understand. Therefore, the little level of knowledge passed to non-technical workers is hindered. Language is one of the powerful tools engaged by the Chinese to attain growth and development. This is due to the fact that Chinese edify their local languages, and rarely learn English, which we consider the official language. This, to a large extent, create a communication gap between CCECC expatriates and the Nigerian rail workers, which may lead to an unsustainable outcome for the SGR project in the country.

Similarly, the findings showed that the reluctant attitude of the Chinese rail expatriates to transfer core aspects of the railway infrastructure-related skills to the Nigerian railway personnel contributed to the challenges faced by Nigerian personnel in the SGR project in the country. This was illustrated further by one of the Nigerian rail engineers that the limited role given to the Nigerian rail engineers is a wider plot by the Chinese to ensure the Nigerian government still depends on them to sustain the modernized SGR in the country:

“There are difficulties in transferring the skills to local Nigerian personnel. There was a time the Minister of Transportation inspected the ongoing Lagos-Ibadan rail project. The Chinese were mandated to integrate qualified local engineers into the project, which would take over and understudy the Chinese expatriates. But it seems the Chinese did not want to disclose or let the local personnel know about the skills; they ended up using unskilled labourers.” *(IDI, Male, 48years, Rail Engineer, Principal Technical Officer, NRC, Lagos)*

The above response indicates that the Chinese CCECC in charge of the SGR project shows a lack of commitment to dealing with Nigeria. This is obvious by their reluctance to train the technical officers of the Nigeria Railway Corporation. This kind of situation portends suspicious signs and a breach of contract, which may hinder the success of the SGR operation.

Moreso, the findings showed that lack of knowledge on rail rack moulds, which require chemicals sourced from China, and lack of integration of the metal fabrication factories in the country, which was neglected by the Chinese rail expatriates, is of great challenge for the sustenance of the SGR project. This was acknowledged by one of the Nigerian rail engineers:

“...we have Ajaokuta and Osogbo steel factories in Kogi and Osun state, but they were not integrated into the projects. Nigeria can produce railway brake parts and small components of the railway parts, but the bigger aspect of the railway equipment and parts cannot be done by the Nigerians. We cannot do the production of the railway parts without the help of the Chinese, which is a serious challenge to the railway subsector in Nigeria.” (*IDI, Male, 48 years, Rail Engineer, Principal Technical Officer, NRC, Lagos*)

This is also borne out by one of the participants that methods employed by the Chinese terms of construction of the rail tracks mould, which required specialized materials, have received less attention from the Nigerian government, which is a serious challenge to the railway sub-sector:

“Adoption of the aspect of rail track mould, which serves as sleepers for the rail line in the current SGR, is a serious challenge to the Nigerian government. This design is new to us because it requires so many processes, including the mixing of a chemical, which can be sourced from China, but the indigenous rail workers have little knowledge of it. The idea has not been localized by the Nigerian government” (*IDI, Male, 35 years, Rail Mason, Non-technical Worker, Lagos*)

The assertions above indicated that the indigenous industries dealing with steel materials do not have significant input in the SGR project. The argument is that the project is massive and cannot be done by Nigerians, hence the presence of Chinese rail expatriates in the country. In essence, while this seems to be true, how do we deal with the knowledge hoarding of the Chinese rail construction company with a partnership agreement that has decided to monopolize knowledge? It is also an issue that the moribund industries that have been neglected by the Nigerian government continue to suffocate in extinction and have received less attention from the government that has been evangelizing social infrastructure and economic diversification. Nigeria, as a developing country, while relating with an advanced economy, ought to have cultivated the habit of integrating the local industries into their partnership agreement, especially with the Chinese. This has the capacity to help in the adaptation process.

In other findings, the principal rail officer of the Ministry of Transportation contends that adaptation of the Chinese language will enhance the Chinese skills transfer in railway infrastructure development through Nigerian government investment and training of Nigerian personnel in the Chinese language in China. This is believed will give the Nigerian rail personnel a cogent understanding of techniques and methods employed by the CCECC on the SGR project in the country:

“There is a language barrier between the Nigerian personnel and the Chinese CCECC handling the rail project in the country. I would like it if the government could try and send some of the personnel to China to learn the Chinese language in order to understand better the techniques and methods employed in the rail project. Most of their equipment is written in the Chinese language, which is difficult to understand.” (*KII, Male, 45years, Principal Rail Officer, Min. of Transportation, Abuja FCT*)

The assertion above affirms the position of language as a catalyst for new technology adaptation. To quickly adapt to skills transferred by the Chinese, the language barrier is an issue to be addressed. While it was contended by the participant that Nigeria should send some rail personnel to China for the purpose of learning the Chinese language: an idea that seems brilliant as it would help them to quickly identify equipment written in the Chinese language and to communicate well with the Chinese. The problem with this arrangement is based on the fact that Nigeria unconsciously will continue to remain subservient to China. One of the ways by which economic domination was sustained was through the imposition of language. Therefore, SGR partnership's success-driven approach forcing Nigeria to learn the Chinese language may eventually be the beginning of long-term domination of the country.

### **Discussion**

Findings showed that the majority of the skills transfer was of major benefit to the non-technical in the SGR project. In essence, the partnership also facilitated local content and training of NRC personnel and Engineering Students of one of the Nigerian Universities to China to learn more about railway-related skills. Yet, technical rail personnel were given limited access and training related to a core aspect of railway infrastructure-related skills: the process of transferring the knowledge seems to be slower than expected. This is corroborated by the studies in the literature by Taylor (2007), Amadasun (2008), and Oyeranti et al. (2011) about rising concerns of Chinese companies in transferring skills and technology related to infrastructure development to local personnel in Nigeria. In essence, the big question is why is it that Nigerian engineers are not fully being carried along because that is the group that is most important in this skill transfer if truly Chinese have the intention of transferring these skills. This put a dent in the dream of this project sustaining the railway sector in Nigeria. This raises huge concerns about the political economy of Nigeria in terms of policies, projects, and issues of maintenance and sustainability.

Findings further established that most of the Nigerian trained workers by China Civil Engineering Construction Company (CCECC) were non-technical rail workers and were only trained through on-the-job training. This is in line with the findings of Wissenbach & Yuan (2017) and Yunnan (2018) that unskilled workers were the major beneficiaries of Chinese skills and technology transfer through learning by doing during SGR projects. In context, this raises a huge concern about the sustainability of the railway sub-sector in Nigeria because unskilled workers may not have much to contribute to designing and constructing train tracks. They can only be useful in minor maintenance tasks, and that does not translate to the transfer of technology. This raised questions on the mode of knowledge transfer adopted by the Chinese CCECC.

### **CONCLUSION**

The reluctance of the Chinese to transfer skills to Nigerian engineers is a major setback towards the realization of the dream of sustainability of the railway sector in Nigeria. The reason is premised on the fact that the Nigerian government pays more attention to promoting job opportunities for its people through the SGR project but pays little attention to how the rail project will translate to cogent skills and technology transfer for the sustainability of the railway sub-sector. The decision to side-lined the Nigeria Society of Engineers indicated a serious loophole in the partnership

between Nigeria and China on railway infrastructural development. It is a fact that infrastructure projects in Nigeria before and during implementation do receive greater attention and promulgation by the government. Thus, it received less attention immediately after the completion of such a project. This serves as an antecedent that trailed the issue of capital projects in Nigeria, which do not usually see the light of day. The paper recommended that government should look critically at the content of the Sino-Nigerian rail partnership in terms of the level of skills transfer.

Technical and mechanical personnel of the Nigerian Railway Corporation should be recruited and given increased engagement and active role in Sino-Nigerian rail infrastructure modernization in the country in order to ensure the quality outcome of local capacity development. Exploration of the Itakpe iron ore and Ajaokuta steel factories, which are of indigenous materials, should be integrated into the construction of the SGR projects in Nigeria. This could be done through a partnership with the Nigerian Society of Engineers, related research institutes, Universities, and local experts on research and innovation that focus on improving and developing indigenous technology that ensures the long-term lifespan of the rail infrastructure materials. Quality welfare packages should be provided for the railway workforce in order to motivate them to discharge their duties to the optimum. These will ensure the long-term development and maintenance of the SGR, especially along the corridors of the host communities. In all, the study concluded that there is an apt need for Nigeria to develop her own indigenous technology that will be viable for long-term usage of the railway sub-sector without relying on external technology.

However, critical examination of 40 percent of local content that emanated during the findings in the study might be investigated further to know the extent to which it is being achieved. The same study might be carried out on the views of other members of host communities about the SGR project in terms of prospects and challenges to find out the possibility of achieving the same findings.

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