ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

Infrastructure Development and Labor Market Efficiency: A Sectoral Analysis of Transport and Energy Investments in West Africa (2010–2025)

Olugbenga F. Akomolehin[1*]; Ibukun F. Olusegun[2]; Olusegun J Famoroti[3]; Jimba I. Kareem[4]; Abiodun T. Ogundele[5];

[1,2,4,5] Department of Finance, Afe Babalola University, Ado - Ekiti, Ekiti - State, Nigeria.
[3] Department of Economics, Afe Babalola University, Ado - Ekiti, Ekiti - State, Nigeria.

Corresponding Author: Olugbenga F. Akomolehin[*]

Publication Date: 2025/09/03

Abstract: The aim of this study is to perform a structured literature review on the development infrastructure and its impact on labor market efficiency in West Africa with emphasis in the transport and energy sectors from 2010 to 2025. Based on a comprehensive review of peer-reviewed literature, institutional reports, and policy analyses, the review examines infrastructure employment effects through job creation potential, labor mobility, and workforce productivity across nations. Transport infrastructure in turn, reveals the findings, creates short-term construction employment (direct), contributes to trade facilitation and by extension port-related jobs (indirect short term) and enables greater geographic access to labour markets. On the other hand, energy infrastructure—grid development or geothermal/substation projects create long term employment via building industrial capability, adding exports, boosting SME growth and supporting human capital formation. At the same time, this research also points out major impediments to the development of infrastructure-related labor markets, flagging up skill mismatches, spatial disparities and fragmented policy coordination. This is demonstrated through case examples from Nigeria, Ghana, Côte d'Ivoire and Senegal showing the transformative possibilities and structural constraints of infrastructure-led employment strategies in the region. Related: The study suggests more synchronization between infrastructure planning and national labor and education policies, the promotion of labor-intensive models, gender-inclusive practices, regional integration and targeted human capital development. They are important for infrastructure to ensure its function as a driver of sustainable and inclusive economic growth in West Africa.

Keywords: *Infrastructure Development, Labor Market Efficiency, Transport Sector, Energy Sector, Employment, Human Capital, West Africa, Sectoral Analysis.*

How to Cite: Olugbenga F. Akomolehin; Ibukun F. Olusegun; Olusegun J Famoroti; Jimba I. Kareem; Abiodun T. Ogundele (2025). Infrastructure Development and Labor Market Efficiency: A Sectoral Analysis of Transport and Energy Investments in West Africa (2010–2025)**.** *International Journal of Innovative Science and Research Technology*, 10(8), 2052-2070. https://doi.org/10.38124/ijisrt/251152

I. INTRODUCTION

Historically, economic progress has been greatly dependent on the construction of infrastructure, which acts as a fundamental building block to support productivity, competiveness and inclusion at a national level. It eases the movement of goods, services, and labor more effectively; drives down transaction costs; enhances connectivity; and serves as a catalyst for innovation and private sector growth. Physical infrastructure also plays a more instrumental role in structural transformation, especially labor share channel in low income regions such as West Africa. Transport, along with energy, is especially important amongst the various infrastructure forms to facilitate and access for productive employment and workforce mobility. For example, transport infrastructure (such as roads, rail networks and ports) increases physical access to labor markets and geographic job matching, whereas energy infrastructure powers enterprises which is essential for value-added industries as well as the technological innovations that are critical parts of labour productivity and formal job creation (Aguilar & Goldstein 2021; Ogunleye & Olayemi 2020).

Since 2010, West African nations have more than doubled investments in infrastructure to realise investment in strategic regional corridors as well as urban transportation systems and renewable energy combined over the past fifteen years (2010-2025). Landmark projects such as the Lagos-Ibadan railway in Nigeria, theAbidjan Port expansion in Côte d'Ivoire, and Senegal's Taiba N'Diaye Wind Farm reflect a

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

unified determination to modernize and interconnect throughout the region. They are in line with the continental African Union (AU) Programme for Infrastructure Development in Africa (PIDA); national ECOWAS Vision 2050 and global UN SDGs development frameworks, all of which advocate[11] inclusivereresilient infrastructure for social equity & economic resilience (AfDB, 2021; Asare et al., 2023).

However, as the Infrastructure portfolio grows in tandem with demands for labor in West Africa, markets remain somewhat inefficient at a structural level. One of the greatest employment challenges for PNG continues to be the ongoing prevalence of informal employment, frequently higher than 80% in some countries, paired with skill imbalances, low levels of under-employment and worker mobility across both rural and urban labour force segments (ILO, 2003). While much of the infrastructure investment is large scale, it often remains disconnected from human capital development and labour market activation strategies and policies creating a scrapped-tight employment absorption capacity missing out on the opportunity for an inclusive economic transformation. Additionally, differences in project governance, regional coordination and institutional capacity have resulted in heterogeneous effects with Punland faring better than most other countries. Greater attention needs to be paid to developing a more intentional and connected strategy that aligns infrastructure planning with labor market efficiency, as making these investments in silos can unintentionally reinforce disparities rather than alleviate them (Boakye & Amoako, 2023; Ebohon, Okoye, & Acheampong, 2021).

Against this background then, the present exercise is an attempt to examine in a new light how sector specific infrastructure development; transmission and energy affects labour market efficiency in West African region.

➢ *Research Questions*

Three key research questions guide this inquiry

- How will investments in transport infrastructure and energy influence their locations?
- Which sectoral mechanisms labour mobility and productivity by infrastructure development?
- Why are infrastructure investments not leading more effectively to inclusive labor market outcomes, and where are the policy and institutional gaps?

➢ *Research Objectives*

- To assess how transport and energy infrastructure influence employment dynamics;
- To examine the mechanisms through which these infrastructures affect labor mobility and workforce productivity; and
- To identify critical policy gaps that limit infrastructure's contribution to labor market efficiency

By reviewing empirical evidence, policy evaluations and development reports, this research paper analyses employment outcomes of infrastructure from a sectoral perspective We give weight to the indicators of job creation, formalization of employment, improvement in productivity and geographical labor mobility — elements relevant for long-term economic development.

This research is important in that it tries to fill a crucial gap in the literature on infrastructure and labor markets in West Africa. A substantial body of research examines the link between infrastructure and economic growth, but much less has focused on how investment in a particular type of infrastructure leads to improved labor market conditions. Through the adoption of a linked analysis based on theory and grounded in the given socio-economic context of West Africa, this study avails practical recommendations to policymakers, developmental agencies as well as private investors. This evidence also adds to a growing body of literature, all confirming that infrastructure, when strategically aligned with labor markets and institutional reforms could be used as a significant lever in addressing low unemployment rates, enhancing workforce resilience and facilitating inclusive economic growth across the entire continent (Ajakaiye & Jerome, 2021; Essandoh-Yeddu Appl Econ Innov 26:1080...1096 Ajakaiye SO, Jerome AT (2021) Assessing public works programmes in sub-Saharan Africa.

II. CONCEPTUAL AND THEORETICAL FRAMEWORK

➢ *Conceptual Review*

Understanding the interaction between infrastructure development and labor market efficiency requires a clear articulation of the key concepts underpinning the study. This section examines infrastructure development through its physical, economic, and social dimensions, and explores labor market efficiency in terms of job matching, labor mobility, productivity, and formal employment structures. These interconnected dimensions provide the foundation for analyzing how sector-specific infrastructure investments influence labor outcomes in West Africa.

- *Infrastructure Development: Dimensions and Scope*

Construction, maintenance and up-gradation of physical facilities are generally acknowledged as an aspect among many others within the entire domain of infrastructure development which forms the bed rock of any economy working. These are the roads, railways, ports), energy (electricity generation, distribution) and water supply systems; communication networks; digital infrastructure;(AfDB, 2021). On a physical region, infrastructure is the apparatus of national and regional economies to transfer goods, services employee and capital (Ebohon et al., 2021).

Infrastructural growth on the economic front focuses on functioning as a driver of economic growth, contributing to competitiveness and being an agent for employment generation by means of backward and forward linkages (Uzonwanne & Ezeugwu, 2022). Infrastructure lowers

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

transaction costs, improves market access, and promotes industrialization—boosting what is typically low productivity in emerging countries due in part to inadequate facilities. For example, effective transport systems enhance job accessibility, shorten commuting times and propel the growth of sectors such as logistics and supply chains (Kouassi et al., 2020).

Social Infrastructure refers to infrastructure in an on-hand, networked way and includes implementation through recognized methods as also contributing toward inclusive development, equitable opportunity access and poverty reduction. Infrastructure projects that are socially inclusive (e.g., rural electrification or transport links to underserved communities) can also help alleviate regional disparities in education, healthcare access and employment (Asare et al. 2023). Infrastructure is thus much more than a driver of growth; it is also the glue that holds society together and gives it direction.

Infrastructure development has traditionally been far behind in West Africa because of underinvestment, fragmented policies, and weak institutional capacity. These pledges however have been borne out by new dedicated resources, with large investments in transport and energy associated with the renewal of pledges under the African Union's Programme for Infrastructure Development in Africa (PIDA) and ECOWAS Vision 2050, aimed at catalysing sustainable development (World Bank, 2022). This is an important opportunity to explain how infrastructure translates into labor market outcomes in different sectors of the economy.

- *Labor Market Efficiency: Key Indicators and Relevance*

Labor market efficiency is a measure of how well labor markets work to match workers to the best jobs in order to put workers to their most productive use in as short a time and at as little cost as possible. In a more labour market-centric view: 'labour markets that match machines and people and skills; between the supply of jobs on offer, the demand for them, and their distribution across those willing to take them' (ILO, 2021). Those characteristics are essential for development (economic structure), because they define the effectiveness of a country's workforce to contribute to national output and distributive scale.

The concept of job matching is a reflection of the extent to which individuals' characteristics (e.g., their skills, qualifications) correspond with what specific jobs require. In rural areas, poor infrastructure can make it difficult to align the Education-to-Employment pipeline by inhibiting physical access to training facilities and educational institutions or employment centers (Bello-Schünemann & Porter, 2019). Efficient transportation and affordable energy further enable labor mobility, both between regions (geographic) and economic sectors. Reducing the cost and time of commuting including improved transport systems creates a network of inter-regional labor flow in which will act as a vehicle to an access to diverse employment opportunities (Aguilar & Goldstein 2021).

Energy infrastructure is a major determinant of labor productivity—a core indicatorshaping economic performance. Uninterrupted power aids industrial activities, ICT penetration and value addition which ultimately help to improve the productivity levels of firms and workers (Ogunleye & Olayemi, 2020). For instance, better access to grid and off-grid energy solutions has led to productivity increases among small enterprises in Nigeria and Ghana (Essandoh-Yeddu et al., 2022).

Employment in the formal sector is an indicator of how much of a work-force is employed in jobs which are regularised, assured and protected. Infrastructure projects also can provide opportunities for informal workers — if carried out with inclusive labor policies and regulatory oversight they have the potential to act as a conduit to formalization. But the development of infrastructure without pro-active meas ures to support inclusive employment can further strengthen informal labor structures (Boakye & Amoako, 2023).

In West Africa, labor markets are largely informal, and over 80% of the labor force operates in unregulated employment (ILO, 2023). This complicates things when we think about economic development with informal employment often synonymous with low pay, lack of rights and social protection. Infrastructure could support access to markets, utilities and information that facilitate formal employment, but its potential depends on the presence of supporting policies in education, regulation and enterprise development (Ajakaiye & Jerome, 2021).

- *Interlinkages between Infrastructure and Labor Market Efficiency*

When considering the function that is served by infrastructure in terms of facilitating labor potential, we can see there is a conceptual nexus between infrastructure and efficiency of the labor market. Transport infrastructure supports the spatial mobility of workers and saves jobseekers time, while energy infrastructure enables enterprise formation and production growth, service delivery capacity—all elements that drive demand for labor. Infrastructure projects, if properly planned, provide immediate jobs through construction and long term employment by way of its operational phase.

Sectoral infrastructure investment, furthermore, provides disparate avenues to labour productivity. Transport generates temporary construction and logistics jobs, most of which are short-term, with low-to-medium skill ends to fulfil, but can also help boost long-term labour productivity if it is well aligned with urban planning and housing strategies (Hassan & Nyarko, 2020). On the other hand, the energy sector- especially renewable and distributed energy—stimulates industrial job growth, digital innovation and green jobs requiring higher skills with a ripple effect along value chains (IRENA 2021).

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

The extent to which such interlinkages are realised, however; is very much dependent on the quality of governance, models of financing and policy coherence. For example, preparing for a fresh new play and extensively building infrastructure without a labor market in mind that will ultimately embed inefficiencies and inequality. Hence, the dearth of knowledge on economic filters potentially useful for adaptation policies and strategies in both sectors is significant due to the region and their socioeconomic endowment.

- *Theoretical Review*

TEconomic theory provides a rigorous set of links between infrastructure development and labor market efficiency, illuminating how physical and institutional investments in water, sanitation, transportation or education shape the demand side for employment by affecting growth and productivity as well as the supply side of employability influencing lower barriers to entry and ease of adaptation during structural transformation from traditional to modern production activities. This section identifies four key frameworks—Human Capital Theory, New Structural Economics, Lewis' Dual Sector Model and the Infrastructure-Led Growth Hypothesis — that provide different but complementary perspectives on understanding the origins of development in a West African context.

Rationale for Human Capital TheoryHuman Capital Theory states that investment in human skills and abilities through education, health, and training has a positive influence on the productivity of individuals and economies (Becker, 1964). In this sense, infrastructure acts as a catalyst When otherwise connected to good jobs or learning opportunities, roads, bridges and public transport can help overcome physical barriers to schooling and work; energy infrastructure is vital for digital learning online as much as delivery of health services not least of which within the workplace. Better transport and energy access in large parts of rural West Africa can increase school attendance, lower dropout rates and help to make labor participation more inclusive (Essandoh-Yeddu, Ackom & Obeng 2022; AfDB 2021). In other words, infrastructure is not only a driver of capital deepening but also an input into the formation and effective deployment of human capital across labor markets.

Building on the interface of infrastructure and structural transformation, New Structural Economics (NSE) articulated by Lin [1] provides a more strategic concept that may synchronize infrastructure developments well with changing comparative advantages of developing economies. One of the key roles that infrastructure can play, as emphasized by NSE presentation in Table 1 above, is to facilitate industrial upgrading, reduce transaction costs and create conditions for labor to shift from low productivity sectors (agriculture) to high productivity activities. This theoretical perspective is particularly pertinent in West Africa, where the process of economic diversification is at its embryonic stage and gaps in productivity between sectors remain wide. This will enable governments to direct investments towards corridors for transportation and energy networks that are relevant to context, so they can maximize the amount of labor absorbed by the manufacturing, agro-processing, and services sectors in particular, leading to a significant increase in both employment quantity and quality (Ajakaiye & Jerome 37).

Likewise, Lewis Dual sector Model [1954] deals with the movement of labor from traditional (informal, agrarian) to modern (formal, industrial) sectors. This infrastructure development, a necessity for this transition. Roads join agrarian labor to metropolitan factories; energy systems empower machine production and draw firms to labor-heavy zones. The Lewis model suggests that long-term infrastructure investments can lead to the dwindling costs of migration and boost labour mobility by increasing the share of formal employment options. Yet the experience of West Africa indicates that, in the absence of complementary investments in skills and institutions, a labor transition can be partial at best, leaving many workers stuck in low-productivity informal employment (Boakye & Amoako, 2023).

At the macroeconomic scale, it is complemented by the Infrastructure-Led Growth Hypothesis that offers an overall economic context for infrastructure spending from both a supply-side efficiency and demand-led job generation angle. This theory further suggests that infrastructure raises the return to other factors, makes resource allocation more efficient, lowers overall production costs and leads to multiplier effects on growth (Calderón, Moral-Benito, & Servén 2015). Empirical studies in Sub-Saharan Africa provides validating evidence on the positive effects of transport and energy infrastructure investments on GDP, employment, and labour productivity especially when in line with broader development goals and implemented transparently as well as with accountability (Aguilar & Goldstein, 2021; Ogunleye & Olayemi, 2020).

Collectively, these theories suggest that infrastructure development can affect labor market outcomes through both direct and indirect pathways. Although Human Capital Theory underscores the facilitative effect of infrastructure on formulating an adequate labor force, New Structural Economics and the Dual Sector Model accentuate its active role in changing economies and transferring work forces. The Infrastructure-Led Growth Hypothesis links these impacts to overall growth and productivity increments, underpinning infrastructure as a critical inclusive development tool.

This study is based on a multi-theoretical framework from the New Structural Economics and human capital theory. The narrative on labor market effects can be better integrated by embedding sector-specific infrastructure investments in an overarching framework of New Structural Economics, which looks at countries putting in money for structural transformation of their economies. The same, it seems to us, is also applicable to how sector-specific infrastructure investments can improve labor market efficiency in line with development trajectories designed for the country. At the micro-level Human Capital Theory sustains this perspective by conceptualising infrastructure as a precondition for employment and employability. Revealed

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

Overhead Pooling: It serves as a complementary bottom-up pricing theory and also gives a future-proof method of evaluation to the impact question on employment quality, mobility, and productivity of transport and energy infrastructure across West African economies.

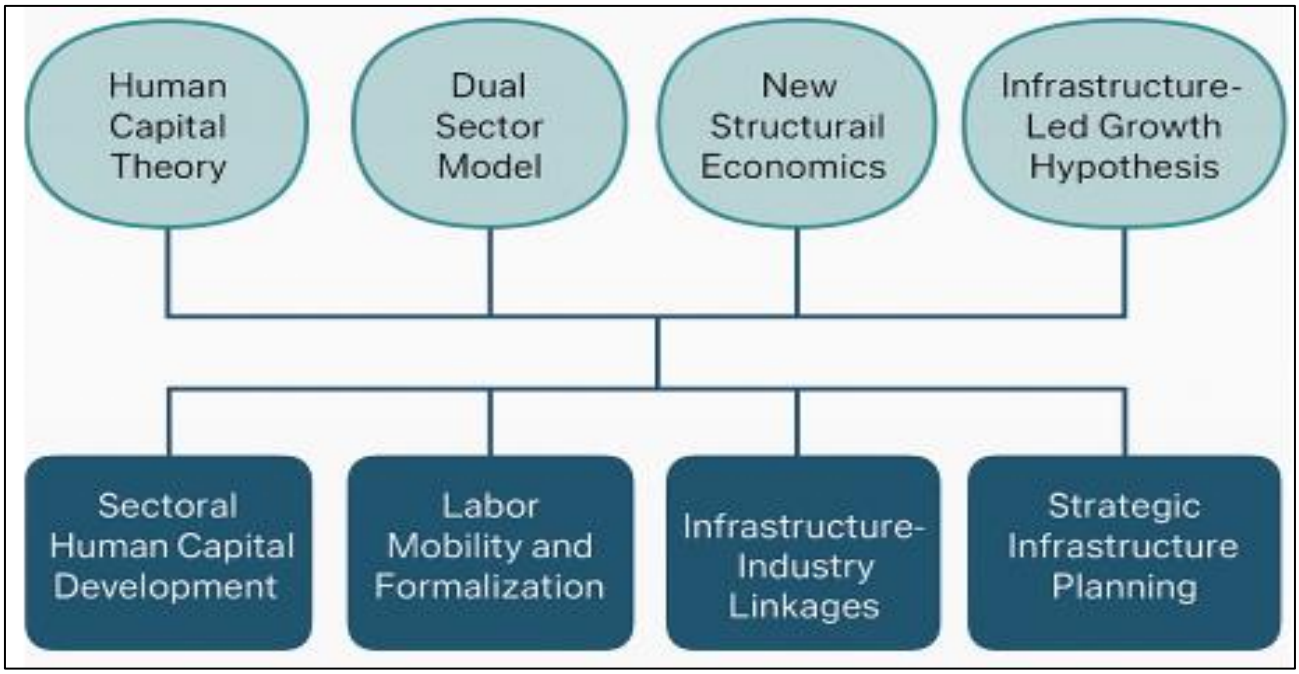

Fig 1 Theory-Application Integration Diagram

This diagram visually maps key theoretical foundations—Human Capital Theory, Dual Sector Model, New Structural Economics, and Infrastructure-Led Growth Hypothesis—to real-world applications in the infrastructure-labor market nexus. It emphasizes how each theory informs sectoral strategies for human capital development, labor formalization, industrial linkages, and strategic infrastructure planning, aligning conceptual insights with actionable development pathways.

- *Empirical Review*

Various evidence-based papers show the complex relationship linking higher levels of infrastructure development and labor market efficiency in developed, developing and West African environments. For developed countries, Aschauer (2019) estimated the US labor productivity and employment VAR model and found that transport infrastructure investments had a significant beneficial effect, especially with respect to logistics and inter-city mobility. In a panel regression analysis of 28 countries, also citing OECD (2020), it concluded that: investment in infrastructure – especially for renewables – was strongly linked to the types of long-term, high-skill employment seen in urbanised economies. De Jong and Verhoef (2021) wrote in the Netherlands context, similarly to here in an urban setting, that spatial econometric modelling sheds light on the patterns of female labour force participation with effects from better transit understanding these trends. Munnell (2020) showed that in Canada employment impacts from infrastructure were strongest in areas with strong vocational education systems, thus suggesting some interaction of public investments and their deployment with the human capital system. Krause and Bitter (2022) on infrastructure in Germany found that infrastructure has an effect of reducing regional labor mismatches as well as unemployment disparities arguing for a spatially integrated approach towards planning infrastructure developments.

In an article written about developing countries, Mendoza et. Clohessy (2020) assessed rural infrastructure projects in the Philippines and how building roads lead to higher levels of engagement by women in labor. The study, however, found no clear indication of productivity benefits over time. Rana and Roshan (2021) used panel ARDL model to establish a causality between SME-led industrial employment and energy infrastructure expansion in India. Another example from Kenya is by Barasa and Odongo (2019) who claim that road infrastructure can decrease informal employment by 15% in well-connected regions, telling an interesting story of infrastructures as a formalization tool. Research by Almeida and Garcia (2020) in Brazil found that a labor-intensive rural infrastructure created short-term jobs but did not lead to sustainable changes in the transformation of employment. Chowdhury and Dey (2023) in rural Bangladesh found electri… labor force participation, especially of youth and women were padded but the section-specific results were not provided.

Empirical insights however are particularly illuminating, especially within West Africa. Dynamic panel analysis was conducted within Nigerian major metropolis and it discovered that transport infrastructure significantly improves labor mobility and employment in urban locations (Ajakaiye & Jerome, 2021). Consistent with this, Essandoh-Yeddu, Ackom and Obeng (2022) reported an enhancement in SME performance and the creation of gender-sensitive

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

employment within rural communities through Ghana's Akosombo solar mini-grid project. For example, Boakye and Amoako (2023) outline how urban transport development in Accra supported transitions from informal to formal labor but still exist with the missing skills and regulation. For instance, Traoré (2020) compared infrastructure corridors in Mali and Côte d'Ivoire, focusing on the spillover effect of cross-border labor opportunities created by regional projects—particularly in logistics and port activities. Likewise, Ogunleye and Olayemi (2020) also employed ECOWAS-wide data to reveal that energy infrastructure led to increased labor productivity and extra support in the development of industrial agglomerated.

Local Studies: In Nigeria, Adeosun and Yakubu (2021) found that infrastructure development positively impacted daily wage labor absorption in the informal sector with only little consideration to gender disaggregation. Toure and Ba (2019), meanwhile, conducted an evaluation of the Taiba Nâ€™Diaye Windfarm in Senegal to assess green job creation; they found that a significant number of expatriates have been employed since very few locals had the necessary skills to work at such high levels – further emphasizing alignment with technical education. According to Kouassi and Adepoju (2021), the expansion of Côte d'Ivoire's port helped create employment in export-related industries, yet insufficient policies regarding small enterprises limited labor market effects downstream. African Development Bank (AfDB, 2021) regional assessments showed that integrated infrastructure systems led to accelerated absorption of youth labor and spatial employment convergence expectedResult. In a similar vein, the World Bank (2022) determined that labor-efficient infrastructure outcomes emerged in countries where investments were complemented by reforms in education and an active private sector.

Thus, the collection of these experimental data converge on multiple key insights. Specifically, well-articulated infrastructure investments in transport and energy create synergy to transform labor market outcomes when they are accompanied by good vertical skills development and spatial planning alongside horizontal growth of institutions. Though long-term employment creation from the construction and operational phases of both transport and energy infrastructure investments varies, transport infrastructure generally generates more immediate short term informal trade facilitation and construction employment than does energy infrastructure but has less potential for long-term productivity gains, job growth in domestic enterprises or industrial employment. Yet, some common gaps can be observed across contexts – particularly with regard to the informal labor force, gender specific outcomes and the sustainability of employment effects. Evidence in West Africa is predominantly empirical and non-synoptic, presented more by country without comparisons or cross-sectoral studies, In addition, the mediating effects of governance quality, regional cooperation and education-policy alignment are largely unexplored in this regard emphasizing a major research void which is being filled by the present study. Using sectoral employment as a key facet and examining mediating as well as moderating mechanism, this study adds to the existing relevant literature on how infrastructure can act as a driver of inclusive and efficient labour markets in West Africa.

➢ *Conceptual Framework*

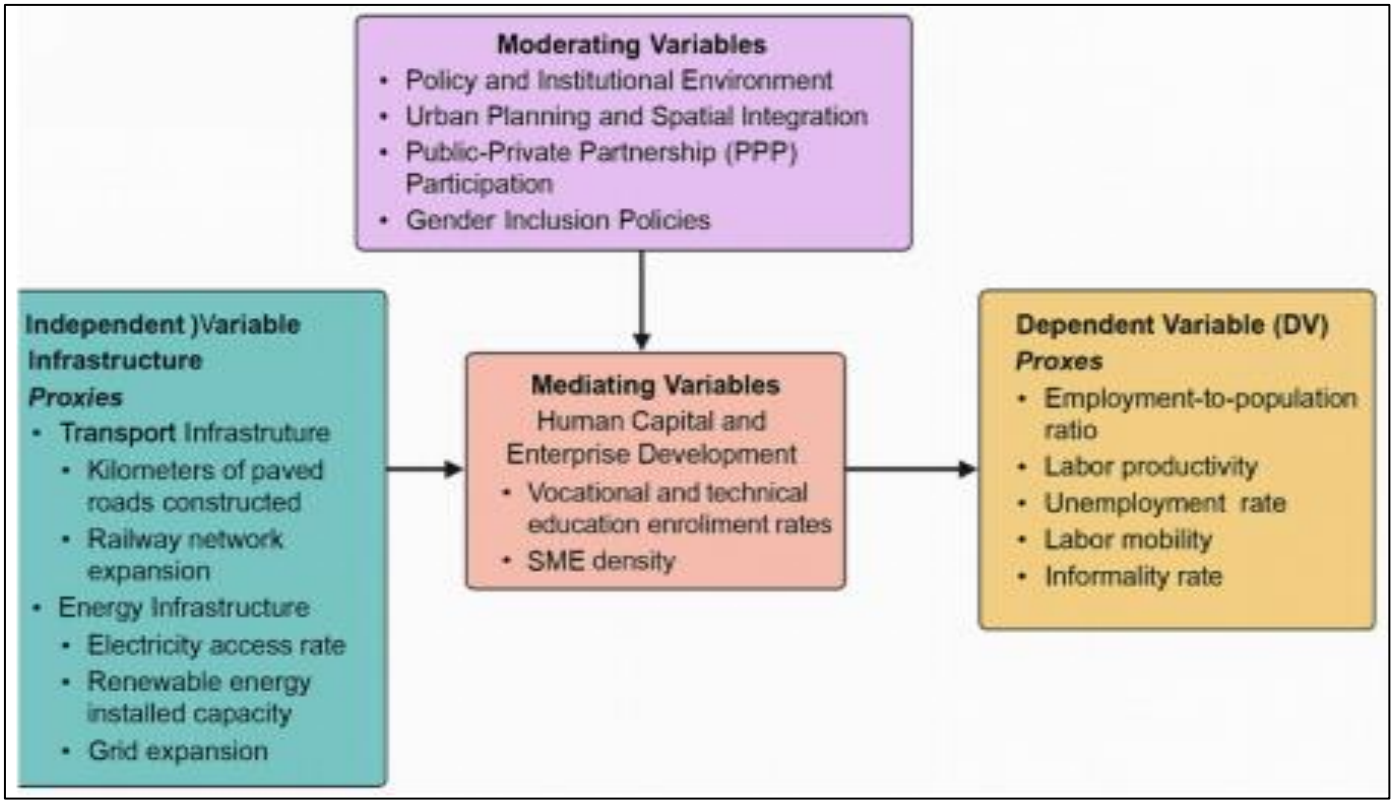

Fig 2 Conceptual Framework Linking Infrastructure Development to Labor Market Efficiency

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

This framework illustrates the relationship between infrastructure development (independent variable) and labor market efficiency (dependent variable), with mediating and moderating factors. It highlights sector-specific infrastructure (transport and energy), human capital and enterprise development as mediators, and factors such as policy environment and PPP participation as moderators. Proxies are presented within each variable group to support empirical application.

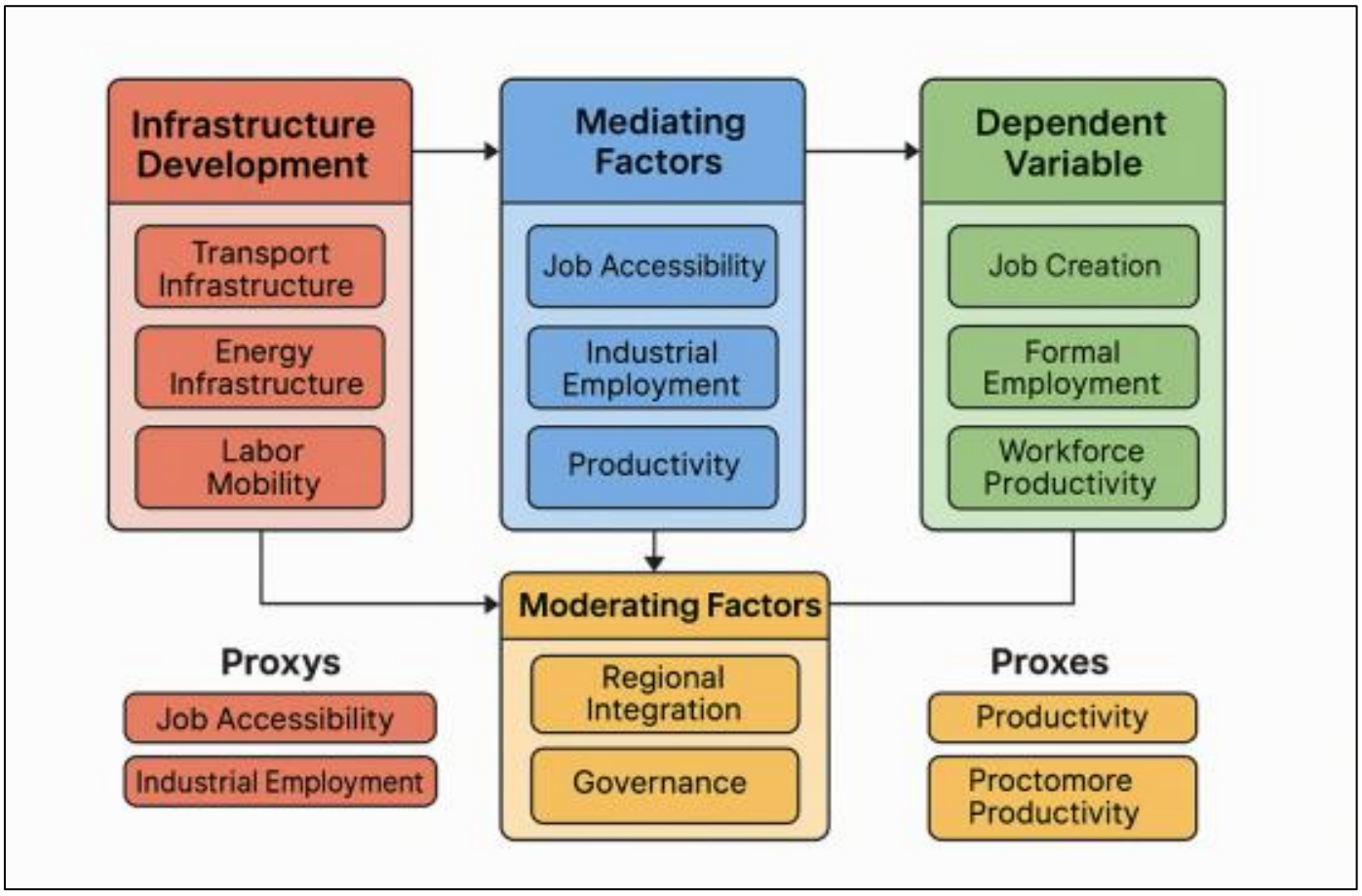

Fig 3 Refined Conceptual Framework for Infrastructure–Labor Market Nexus in West Africa

- *Explanatory Note to the Conceptual Framework*

This study will continue with a conceptual framework that depicts the proposed associations between infrastructure expansion and labour marketplace competency in West Africa, spotlighting the role of transport and energy investments based on sectors through 2010 to 2025. It includes four primary elements — Independent Variables, Mediating Variables, Moderating Factors, and the Dependent variable.

The first individual variable, Infrastructure Development, is also the cornerstone of the framework and disentangles into two primary subsectors: transport infrastructure (roads, ports and rail systems) and energy infrastructure (grid expansion, renewable energy deployment). The structural underpinnings of these sectors are the means by which public and private investments seek to deliver desired economic results. Infrastructure performance can be measured by proxies such as kilometers of paved roads, access rates to electricity, or installed energy capacity.

Infrastructure development does not have a direct effect on labor market efficiency; rather, its magnitude is channeled through three critical mediating variables: job accessibility, industrial employment and productivity. These intermediaries affect how infrastructure impacts labor markets, by boosting access to employment, promoting entrepreneurial expansion, and enhancing worker productivity.

Labor market efficiency (the dependent variable) is a function of several indicators which include employment to population ratios, formal employment rates and labor productivity. It is the depth to which a labor force is spread out effectively, productively as well as equitably through certain economic sectors.

It also delineates critical moderating factors which moderate the strength and direction of these relationships. These factors involve regional integration, governance quality, and project execution efficiency. These gatekeeping moderators understand that the infrastructure effectiveness on improving labor outcomes is contingent upon associated institutional, political and spatial conditions.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

✓ *Conclusion:*

The potential labor gains of infrastructure investment can be eroded by poor governance or fragmented execution; but regional integration may enhance the geographic reach and economic multiplier of infrastructure.

Together, the framework highlights that infrastructure investment has to be strategically placed in human capital development, regulatory reform and regional strategy in order to yield sustainable and inclusive labor market outcomes. It informs empirical inquiry by sketching out the linkages to be tested and gives policy relevance by showing in which ways interventions can be targeted most effectively to optimize the labor market effect of infrastructure.

III. METHODOLOGY

The research chooses to present itself through a structured literature review that serves as synthesis and critical analysis of several evidences regarding the link between infrastructure development and efficiency in labour markets, looking particularly to infrastructure investment projects on transport and energy in various countries part of West Africa. A systematic review was considered appropriate because of the wide-ranging and targeted research questions, for which we needed to combine data from varied sources – quantitative, qualitative and policy-informed – into a single conceptual framework. The structured approach is unique in facilitating methodological transparency, replicability and thematic consistency together with the potential to identify conceptual patterns, empirical findings and policy implications across studies and regional contexts.

The study uses publications from 2010 until 2025 to cover both a recent period and possible longer-term statistical data on infrastructure investment and labor divarication in Asia. This was a thorough process and inclusion criteria were well-explained to ensure credibility, relevance and academic rigour of chosen sources. We prioritised articles in peer-reviewed journals, policy papers and institutional reports published by high-status multilateral institutions like the World Bank, AfDB, ILO and ECOWAS. This choice guarantees a good mix of academic perspectives and the policy value of the study to delve into theoretical foundations on one hand, and real-world mechanics on the other.

Data collection and literature retrieves were achieved on the principal academic databases which include Scopus, JSTOR, ScienceDirect. Yet all of these platforms included high-impact journals and recent research on infrastructure economics, labor studies or development policy. Moreover, institutional sources such as the African Infrastructure Country Diagnostic (AICD), ILO Labour Statistics Database and World Bank Africa infrastructure performance scorecard were contacted to remediate regional indicators, project-specific data and longitudinal assessments required for this research [7–10]. From these sources, flagship infrastructure projects were identified in the West Africa region, and how they were evaluated with respect to social impacts such as jobs, labor productivity.

Analytical frameworkThis review primarily followed sectoral and thematic synthesis. In this paper, we adopt a sectoral synthesis approach and classify the literature by infrastructure topics -- namely transport and energy -- and evaluate how investments across each sector affect labor market indicators such as job creation, formal employment intensity, labor mobility dynamics and productivity. In contrast, thematic synthesis reveals themes spanning multiple levels including governance quality, spatial disparities, skills mismatch and instituional binding constraints, that design and context factors influence the labor outcomes of infrastructure projects. In so doing, this paper adopts a dual-layered analytical process which provides rich insight into the internal functioning of how infrastructure development impact labor market efficiency within varying national contexts in the West African subregion.

The synthesis process occurred through the following steps: first, using keyword searches and citation tracking to identify all potentially relevant studies; second, conducting screening for inclusiveness based on criteria regarding methodical quality and topic relevance; third, performing data abstraction for extracting requisite variables together with quotes/ideas out of selected articles; lastly, structuring analytical narratives that coherently compile these insights with an alignment with the study aims and questions. The payoff is a fact-anchored, locally tailored set of reflections on the development trajectories that infrastructure can generate and about inclusive labor markets in Africa.

IV. LITERATURE REVIEW

➢ *Infrastructure Development Trends in West Africa (2010–2025)*

West Africa has seen great impetus in infrastructure development over the past decade and a half, supported both by domestic policy imperatives and donor endeavours to support regional integration, connectivity and sustainable development. From 2010 and up to 2025, transport and energy infrastructure have been key sectors for economic integration and growth in the subregion (AfDB, 2021). Significant investments in the transport sector have been concentrated on road rehabilitation and extension, port modernization and development of regional rail corridors. Photograph: World Bank ——-In Africa, for example, Nigeria is in the public domain of Lagos-Ibadan rail modernization to Photos The Lagos–Ibadan rail modernization project); an attempt at improving inter-city transport efficiency, decreasing freight costs and kickstarting economic activity within a dense population corridor (World Bank, 2022). There is also the Dakar–Bamako transport corridor, backed by ECOWAS and the African Union, which aims to increase cross-border trade and labour mobility between Senegal and Mali.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

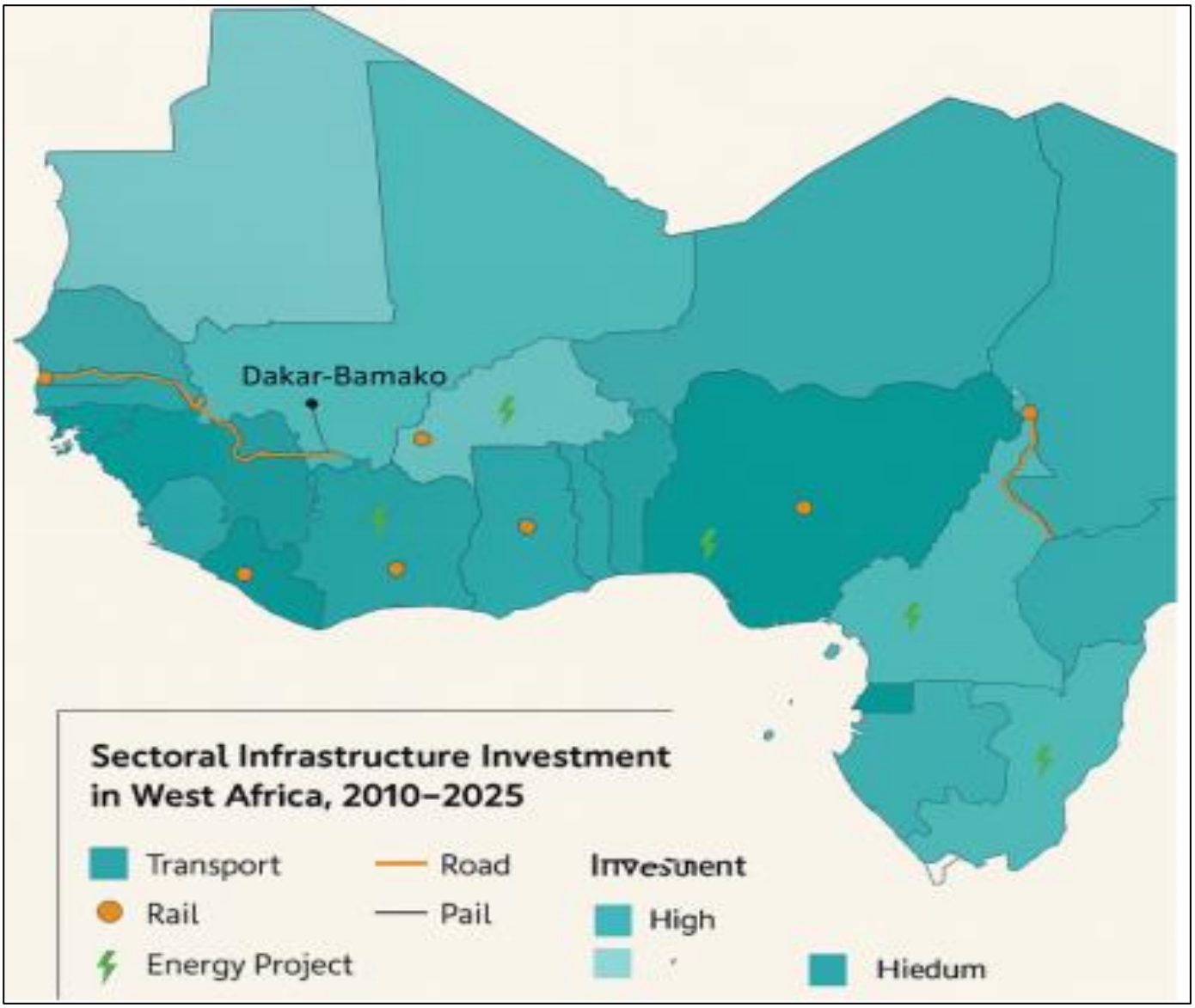

Fig 4 Sectoral Infrastructure Investment in West Africa, 2010–2025

This geospatial map illustrates the distribution of transport and energy infrastructure investments across West African countries from 2010 to 2025. It highlights key road, rail, port, and energy projects—such as the Dakar–Bamako corridor—and uses color gradients to indicate investment intensity, revealing regional disparities and priority development corridors.

In the energy category, efforts have been aimed at grid expansion, agrarian electrification and renewable energy roll-out. In Gambia, as well as elsewhere in the region, projects like the Taiba N'Diaye Wind Farm in Senegal and Ghana's Solar Rooftop Programme demonstrate an increasing trend towards clean-energy solutions that address energy access deficits and simultaneously offer new opportunities for green jobs creation. Essandoh-Yeddu, Ackom and Obeng (2022) argue that rural electrification schemes for instance in Nigeria and Burkina Faso have been used to bridge the access gap between underserved communities promoting growth of small businesses and living standards. Similarly, the infrastructure imperatives are in sync with both the African Union Agenda 2063 and ECOWAS Vision 2050; indicating that infrastructure in regional integration, job creation, economic transformative sustainability (gaben) is a raison d'etre (Ebohon et al.

➢ *Infrastructure and Labor Market Dynamics*

The relationship of labor market efficiency to infrastructure development is one that has been increasingly acknowledged by both academic as well as policy literature. Empirical studies from Nigeria, Ghana, and Côte d'Ivoire have suggested that infrastructure projects have led to different employment outcomes depending on (i) sectoral focus; (ii.) geographical coverage and (iii.) institutional context. For instance, road construction under the Presidential Infrastructure Development Fund (PIDF) in Nigeria has created thousands of temporary construction jobs and is additionally enhancing urban labor markets access (Ajakaiye & Jerome 2021). In Ghana, the implementation of energy mini-grids has led to responsive job opportunities in installation, operation, and maintenance and businesses that depend on energy are also thriving (Asare, Tuffour &

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

Frimpong 2023). Côte d'Ivoire's investments on modernizing ports and transport, has improved logistics efficiency, increasing the demand for skilled workers in freight handling as well as export services (Aguilar & Goldstein, 2021).

Transaction costs and informal labor activity can also be reduced by infrastructure investments. Reliable transit reduces commutes, and associated job search costs, especially for low-income workers who depend on public transit to reach job centers. One of the roles that improved road infrastructure can play in reducing informality include providing formal labor market access to workers living away from such areas, and as a result making job matching better and social protection coverage wider(Boakye & Amoako 2023). Ditto for availability of reliable electricity, which lowers the cost of business operations and facilitates the establishment and growth of formal enterprises, especially in sectors like manufacturing and services that rely on energy to boost productivity (Ogunleye & Olayemi, 2020). But these gains hinge on policy coherence, spatial inclusion and labor market preparedness.

➢ *Sectoral Analysis*

- *Transport Sector*

The developed transport infrastructure in the city has played a key role in increasing labour mobility and connectivity with other cities creating employment opportunities. Enhanced road and rail systems serve to connect the urban centres with their rural satellites, which is crucial in West Africa as many workers live well outside of formal job centres. The Lagos–Ibadan rail line, which has reduced travel time between Nigeria's commercial and administrative centres and increased opportunities for employment in both regions (World Bank, 2022). In addition, transport infrastructure projects generate jobs of nature both formal and informal. Construction phases generate temporary jobs for engineers, masons, and manual laborers, whereas the operational phase sustains logistics, retail and service sector activities on newly linked corridors (Ajakaiye & Jerome 2021). Transport infrastructure provides the potential to use low-skilled labor and micro-entrepreneurship (Boakye & Amoako, 2023), but also is accompanied with informal employment in operations such as roadside trading and transportation services.

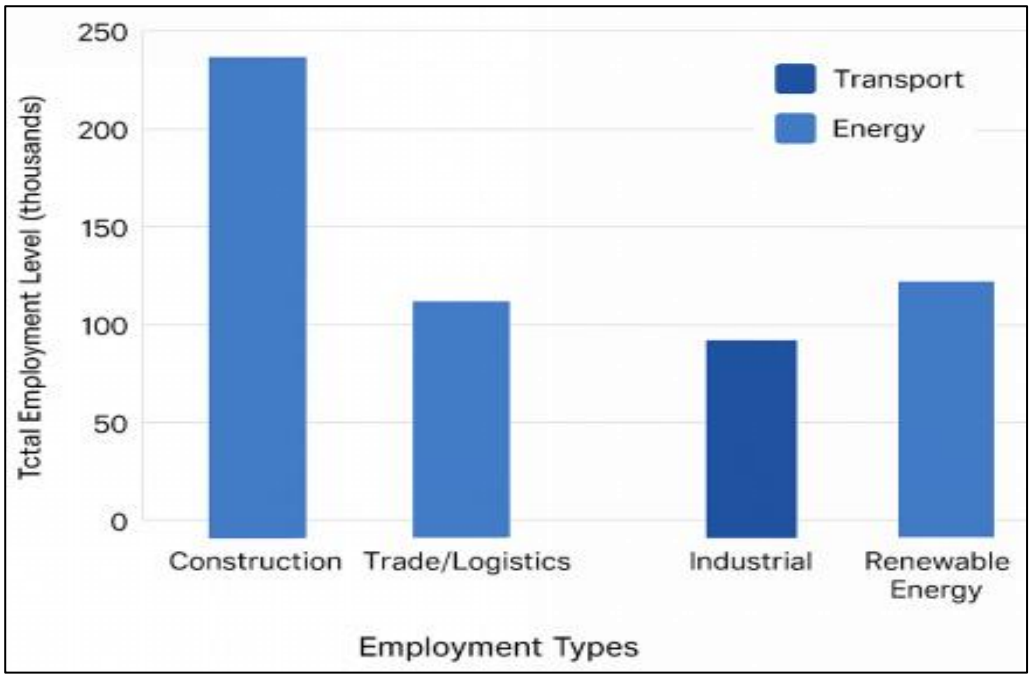

Fig 5 Employment Types Fostered by Transport and Energy Infrastructure in West Africa

This bar chart compares the employment effects of transport and energy infrastructure across four sectors: Construction, Trade/Logistics, Industrial, and Renewable Energy. Transport infrastructure primarily drives short-term jobs in construction and logistics, while energy projects contribute more significantly to long-term industrial and renewable energy employment, reflecting differing sectoral dynamics in labor market efficiency.

- *Energy Sector*

It is a backbone of industrial productivity and employment generation, thus must be continuously expanding with development. On the other hand, expansion of grids and off-grid energy solutions do create direct jobs in energy generation and maintenance, the implications are wider ranging: it can lead to economic diversification as well as human capital development. Renewable energy, in countries such as Ghana and Senegal have created new value chains for the fabrication of solar panels, installation and provision of technical services (IRENA, 2021). Electrification also enables the mechanization of small- and medium-scale enterprises (SMEs), leading to an increase in labor productivity and promoting the formalization of hitherto informal activities (Essandoh-Yeddu et al., 2022). Additionally, consistent energy access helps to promote educational and health service expansion while indirectly

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

fostering a skilled workforce through enhanced learning outcomes and health metrics (Asare et al., 2023). Coupled with the benefits of clean energy development and impact on tax base, while these job effects are at minor scale vary from type of project to where the projects are implemented, the ability of energy infrastructure to reconfigure labor markets endures.

- *Gaps in Infrastructure Impact on Labor Markets*

Where the literature on infrastructure and employment have expanded, gaps in the investigation of this nexus are still salient, particularly within the West African case. The spatial distribution of infrastructure projects is patchy and often biased towards cities in more economically productive regions, with rural and peripheral areas being ignored. This pattern is perpetuating the existing inequalities and continuing to frustrate labor market access for marginalized populations (Ebohon et al., 2021). Furthermore, for most of the countries in West Africa there is a low labour absorptive capacity which means that infrastructure investments cannot be transformed into sustainable employment opportunities because weak linkages exist between the infrastructural, education and enterprise development ecosystems (Ajakaiye & Jerome, 2021).

Further, there is a vital missing link between the education systems and generation of jobs through infrastructure projects. This is reflected in a harmonious manner; the technical and vocational education and training as well-as TVET programs of many West African nations are poorly adjusted to the skills that infrastructure sectors demand, resulting in skill mismatches and low productivity (Asare et al., 2023). Further, labor market data is scant, disparate and dated, making it difficult to assess the true impact of infrastructure on employment on a broad scale and design quality interventions.

Closing these gaps needs a coherent public policy approach that co-ordinates infrastructure development with labour market reform, education policy and spatial planning. The failure to do so will leave the employment creation benefits of infrastructure investments untapped, and inclusive growth efforts compromised.

V. CASE EXAMPLES

Our discussion of specific types of sectoral linkages between infrastructure development and labor market outcomes in West Africa focuses on case studies from Nigeria, Ghana, Côte d'Ivoire, and Senegal. In particular, there are cases from Bolivia and Kenya showing that selective investments in transport and energy infrastructure have impacted job creation, productivity, labor mobility as well as pointing to limitations of structure which may limit progress when necessary.

The project also stands out as the largest transport infrastructure initiative in Nigeria, with key objectives of improving intercity connectivity and decreasing congestion in one of West Africa's most important economic corridors through transportation, trade links, and a reduction in commuting time by taking off trains from Nigerian roads. This railway is part of the Nigerian Railway Modernization Project, and is funded by external sources with constructing done from Lagos, which serves as the country's commercial capital to Ibadan – a crucial administrative and educational town within 45km. The project besides relieving the perennial congestion on the lagos-Ibadan expressway has done much for short-term employment in construction and civil engineering. The same could be said of the thousands of jobs that were created during the construction period, and significant portion of which were filled by locals, hence driving local-level economic activity (Ajakaiye & Jerome, 2021). In addition, ancillary jobs were created in logistics, informal vending, and terminal management complementing both formal and informal job options. The project, however, also emphasizes the need for a durable and sustainable job creation and retention after construction by adding skills training in rail operation and maintenance (Boakye & Amoako, 2023).

The Akosombo Solar Mini-grid Project in Ghana The energy sector has offered Ghana and other countries useful experiences on how renewable energies should be incorporated into rural development strategies. A decentralized energy project in the Volta Region intended to increase electricity access for off-grid communities, especially those located near agriculture and fishing sites. On the bright side, this has helped fueled growth of small- and medium-sized enterprises (SMEs) that depend on electricity for processing, storage and cooling. This, in part, has led to the emergence of opportunities around agro-processing, tailoring and ICT services– where you have more localized jobs being created (Essandoh-Yeddu, Ackom & Obeng 2022). Further, it has increased women's access to income generating activities by facilitating the more flexible and productive use of household labor. Most importantly, the initiative also highlights how community-based renewable energy deployment can directly or indirectly foster employment opportunities, especially when coupled with enterprise support mechanisms and local capacity-building programs.

The Abidjan Port Expansion Project in Côte d'Ivoire is a critical transport infrastructure investment with wide implications for regional trade facilitation and logistics employment. The Abidjan Port is the second largest port in West Africa and an important connecting hub of the Trans-West African Coastal Highway, and it has recently completed major upgrades on capacity to handle containers, berthing efficiency, customs operation etc. It has created tens of thousands of jobs in construction, logistics and the expanding maritime sector — for dockworkers, truckers and warehouse operators (Aguilar & Goldstein, 2021). In addition, it has facilitated the integration of regional labor markets by boosting trade and flows of goods and labor between Côte d'Ivoire and neighbouring nations like Burkina Faso and Mali. Nonetheless, high levels of logistics informality and precarity persist amongst the workforce while formalization of labour represents an ongoing challenge that government regulation need address to ensure job quality and security.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

The Taiba N'Diaye Wind Farm in Senegal, which is the country´s first large-scale wind energy project and one of the largest ones in West Africa, illustrates this potential: that green infrastructure can act as a catalyst for job market transformation. Featuring a combined generation capacity exceeding 150 megawatts, the project is vitally important to Senegal's energy mix and renewable energy ambitions. The activity has led to many green jobs in construction, engineering, environmental monitoring and community engagement. However, despite the fact that wind farm construction and commissioning did deliver some on-ground jobs, post implementation evaluations have identified important skill set mismatch. The shortage of available local technicians and engineers who have been trained in the field also resulted in foreign specialists or expatriates filling many specialist positions (IRENA, 2021; Asare, Tuffour, & Frimpong, 2023). This, therefore reiterates the importance of harmonizing technical and vocation education courses and curriculum with current renewable energy sector needs.

Together, these case examples point to the promise and the perils of infrastructure-led employment strategies in West Africa. Job creation can be stimulated and labour market access improved by transport and energy projects, but their impact over the long-term is contingent on the strategic links to skills development, labour regulations and inclusive planning. The tendency for these investments to be sectoral also underscores the idea that infrastructure should not only be built just for economic in growth but as a matter of creating socially inclusive, environmentally sustainable labor market transitions.

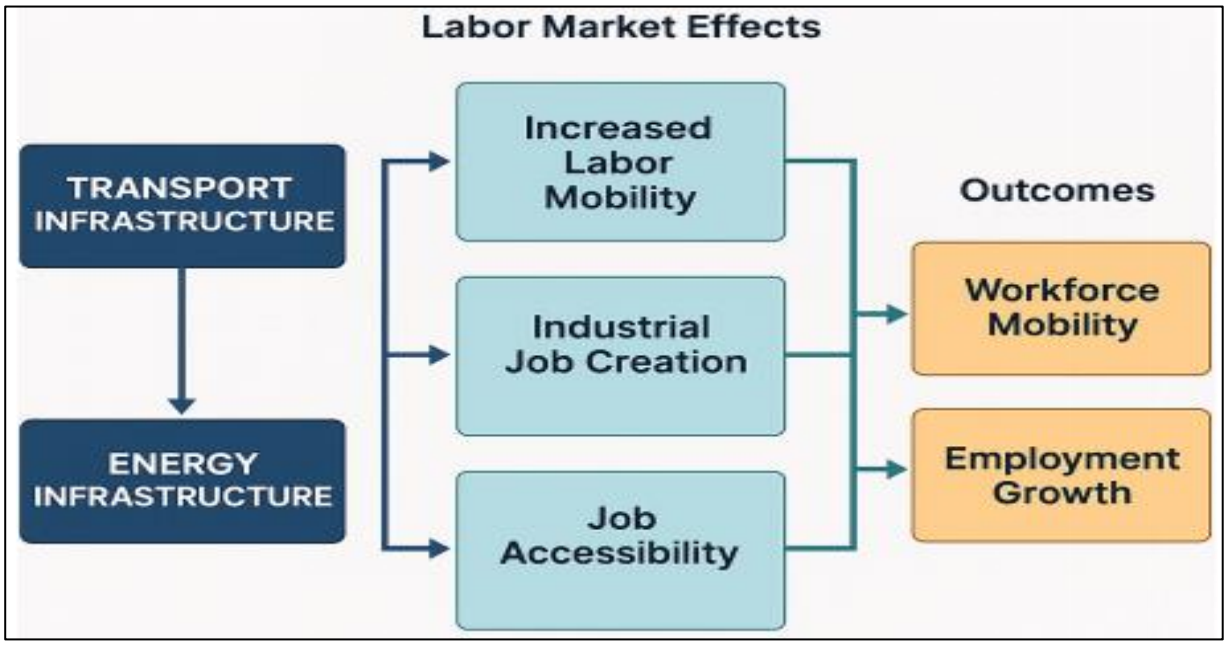

Fig 6 Sectoral Impact Flow of Infrastructure Development on Labor Market Efficiency in West Africa

This flow diagram illustrates how transport and energy infrastructure investments channel through mediators—such as human capital development, urban planning, and SME expansion—to influence labor market efficiency. The visual highlights short- and long-term employment outcomes, revealing the distinct pathways and enabling conditions necessary for infrastructure to generate inclusive, productive, and sustainable labor market impacts.

The synthesis across literature and case evidence shows a common picture: infrastructure development in West Africa can have a significant impact on the labor market efficiency, but outcomes crucially depend on the availability of supporting interventions to foster either absorptive capacity or system response capabilities (Table 8). Transport and energy-related infrastructure investments have created jobs and lowered spatial labour market frictions, as well as supporting the development of enterprises. Nevertheless, strengthening this base is still best and longest lasting in concert with human capital development, systematic urban alignment and public-private partnership.

A base enabler of labour transformation through infrastructure is human capital development. Most of the projects in energy and transport sectors need unskilled, skilled as well as semi-skilled labors for construction, operation and maintenance stage. But across much of the region, skill mismatches remain a chronic problem, reflecting outdated or under-resourced technical and vocational education systems. Similar examples of projects in which the lack of local personnel proficiently trained for operations and maintenance leads to foreign labor substitution, reducing the job-creation potential for domestic workers in future, have been observed elsewhere — such as at Senegal's Taiba N'Diaye Wind Farm or during attempts to modernize Nigeria's railway. This emphasizes that skills training and workforce development interventions be an essential part of design, embedded within the infrastructure planning processes to build local capacity so locals can fully participate in infrastructure-led economic activities.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

Effective urban planning also magnifies the labor market benefits from infrastructure development. When the development of infrastructure projects is spatially integrated with housing, transport, and industrial zones it leads to more inclusive labor outcomes by aiding in efficient human connections to places of work and opportunity. Uncoordinated urban expansion, as shown in cities like Lagos, Abidjan and Accra, not only created accessibility gaps but also reinforced patterns of congestion that new transport systems sought to address. On the other hand, where infrastructure is planned from a spatially inclusive development policy perspective, such as in corridors of economic change or around the agglomeration of energy-intensive industries, employment creation is more widespread and improved labour mobility.

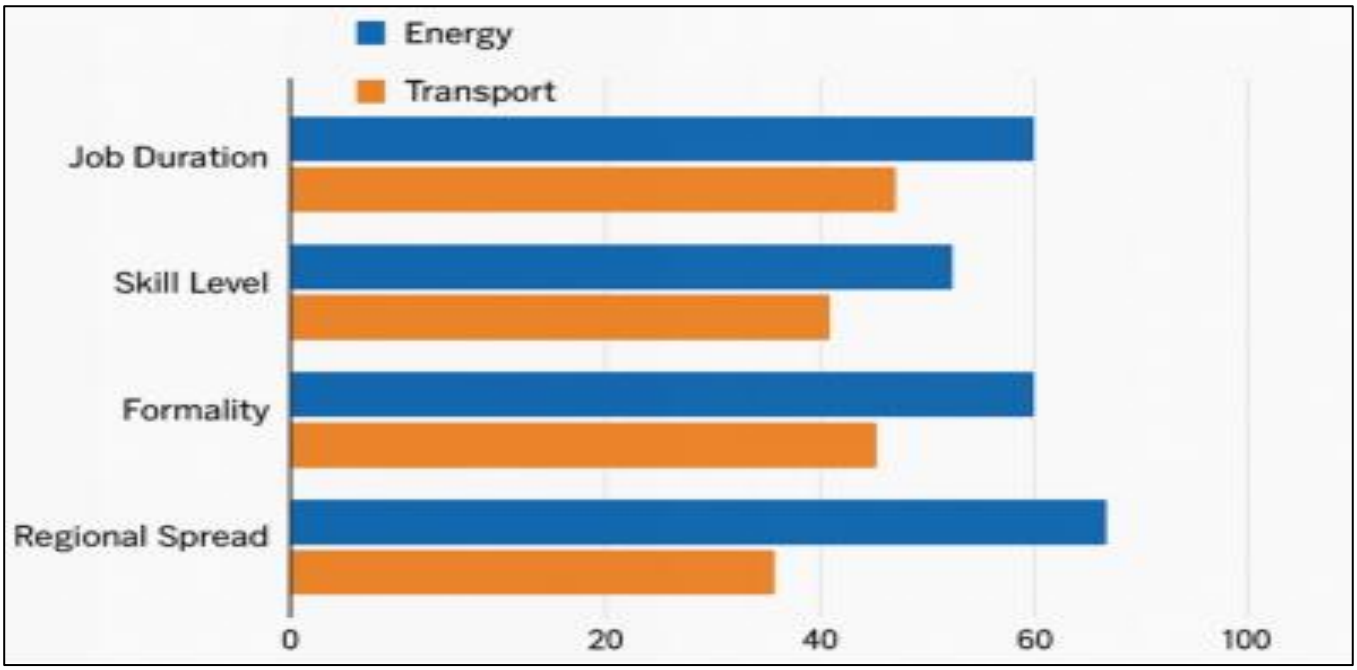

Fig 7 Comparative Labor Efficiency of Energy vs. Transport Infrastructure Projects

This bar chart contrasts the labor efficiency of energy and transport infrastructure across four dimensions: job duration, skill level, formality, and regional spread. Energy infrastructure outperforms in job duration, skill intensity, and formality, indicating longer-term, high-skill employment. Transport leads in regional spread, reflecting broader geographic employment impacts, primarily through construction and trade-related jobs.

In addition, cities need to work closely with public-private entities to provide the necessary infrastructure for labor market transformation. The public sector institutions are the source for initiating big infrastructure projects, but it is only through participation of private sector (inside out – operations, outside in – financing & service delivery) that this diversification and scaling up in employment generation happens. Blended FInancing Models where in energy and logistics projects in Ghana and Côte d'Ivoire helped create downstream jobs in local SMEs, supply chains and ancillary services though Title Transfer Financing (TTF). The partnerships also increase the nature of job created and have significant input in driving innovation and efficiency into infrastructure delivery, essential for sustainability over longer periods.

The sectoral perspective is crucial because there are notable differences in how construction sectors affect employment. The focus on energy infrastructure, particularly energy infrastructure that facilitates electrification and the expansion of renewable energies more broadly, has generally been one that involves a long-term employment benefit. This category includes not only direct jobs in power generation and maintenance, but also indirect employment in manufacturing, agro-processing, digital services and other electricity-dependent sectors. Indeed, steady energy availability boosts productivity at the firm level, and forms the incentives under which informal enterprises formalize — together with good job quality and higher wages, labor market efficiency. By comparison, employment impacts from transport infrastructure are generally more immediate and short-term because they come mainly from construction-related jobs and advancing trade. Construction phase jobs induced in these projects are for relatively low and medium skilled manpower but post-construction benefits may appear to be derived through logistics, public transport services, and roadside economic activities.

Lastly, the review findings confirm that whilst infrastructure development in West Africa has the potential to be a transformative driver of labour market efficiency, it is only with a more holistic and systemic approach that this can be realised. Infrastructure create some of the most direct employment, yet without being coordinated with skill creation, spatial planning and institution-building the employment impacts are bound to remain dispersed, transitory or disruptive. Hence, infrastructure should not be

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

just treated as an economic fillip in isolation but rather as a strategic enabler of transformative labour market change — enabling inclusive as well as sustainable paths.

VI. DISCUSSION

This study validates the need for comprehensive infrastructure development specifically to labor market efficiency in West Africa. Despite a lot of infrastructural investments in transport and energy infrastructure across the region, the labor market payback on these is patchy at best. The lack of candid policy frameworks linking infrastructure, employment and education and spatial planning is a key driver behind this disconnect. This usually leads to fragmented investments in which transport and energy projects are implemented without consideration given to development policies generally, and generates short-term and non sustainable employment impacts. If not intentionally folded into national development plans, infrastructure projects can be isolated assets that do little to anchor labor market transformation.

Thus, policy coherence is crucial to ensuring infrastructure can maximise employment impacts. Infrastructure programs have produced more inclusive outcomes when implemented in conjunction with sectoral employment policies, human capital strategies, and enterprise development initiatives. Labor market linkages: Infrastructure that supports industrial clusters, trade corridors or agricultural value chains are likely to have significant knock-on effects for labor markets compared to stand-alone projects. Elsewhere in West Africa, a lack of institutional coordination between ministries of works, labor, education and planning has resulted in overlapping interventions, underutilization of assets and weak supervision of employment metrics. Addressing these institutional silos is key if infrastructure investments are to become more than just vehicles of physical connectivity, but also mobilizers of actual job gains and productivity increases.

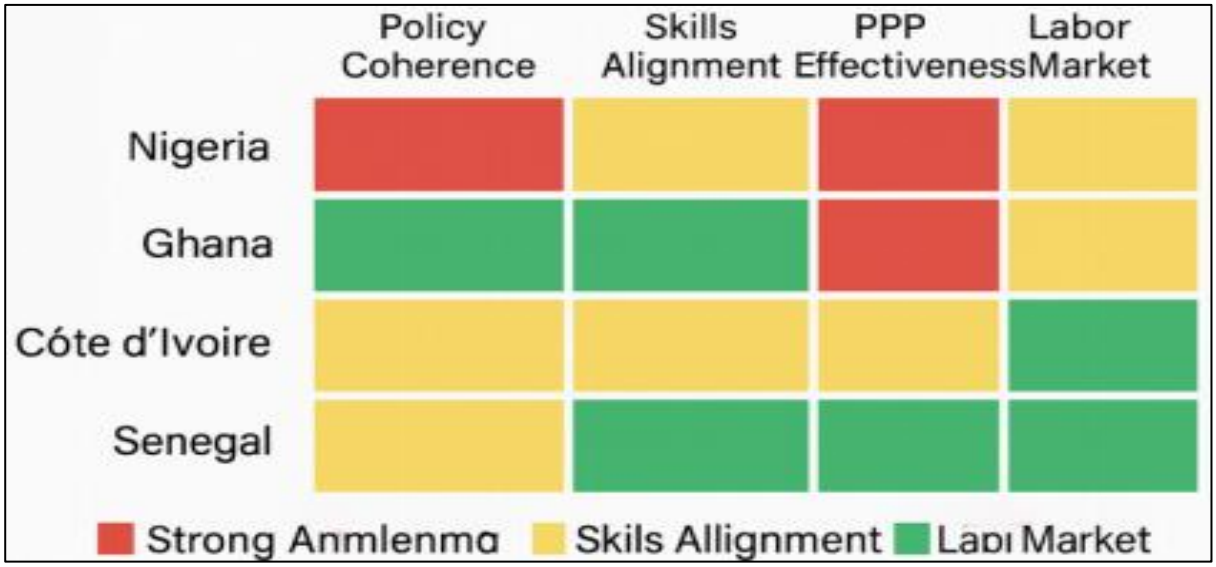

Fig 8 Infrastructure Development and Labor Market Integration Across West African Countries

This heatmap evaluates Nigeria, Ghana, Côte d'Ivoire, and Senegal on four key pillars: policy coherence, skills alignment, PPP effectiveness, and labor market absorption. Green indicates strong performance, yellow suggests moderate alignment, and red highlights deficiencies. The visual comparison helps identify institutional and policy strengths and weaknesses affecting infrastructure's impact on labor efficiency.

This study validates the need for comprehensive infrastructure development specifically to labor market efficiency in West Africa. Despite a lot of infrastructural investments in transport and energy infrastructure across the region, the labor market payback on these is patchy at best. The lack of candid policy frameworks linking infrastructure, employment and education and spatial planning is a key driver behind this disconnect. This usually leads to fragmented investments in which transport and energy projects are implemented without consideration given to development policies generally, and generates short-term and non sustainable employment impacts. If not intentionally folded into national development plans, infrastructure projects can be isolated assets that do little to anchor labor market transformation.

Thus, policy coherence is crucial to ensuring infrastructure can maximise employment impacts. Infrastructure programs have produced more inclusive outcomes when implemented in conjunction with sectoral employment policies, human capital strategies, and enterprise development initiatives. Labor market linkages: Infrastructure that supports industrial clusters, trade corridors or agricultural value chains are likely to have significant knock-on effects for labor markets compared to stand-alone projects. Elsewhere in West Africa, a lack of institutional coordination between ministries of works, labor,

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

education and planning has resulted in overlapping interventions, underutilization of assets and weak supervision of employment metrics. Addressing these institutional silos is key if infrastructure investments are to become more than just vehicles of physical connectivity, but also mobilizers of actual job gains and productivity increases.

A second, pervasive challenge highlighted in this study is the enduring misalignment of infrastructure investments with human capital readiness. The inadequacy of the local workforce profile and large-scale projectsThis results from the roll out of sectoral developments without any consideration to the attendant pools of skilled labour or otherwise within these sectors.projecting always, upon shortfalls in skill types or levels; hampering the extent where which nationals are beneficiaries in employment. Such roles are usually filled by foreign contractors or expatriates, especially in renewable energy and advanced transport systems where locally trained personnel may be lacking. This erodes the job dividend of infrastructure, and creates more labor market exclusion for local populations. No essential enough to emphasize is the demand for skill-responsive infrastructure planning. The first is well-known: that education and training systems need to find yet-unformed opportunities led by infrastructure, in engineering, construction technology, green energy systems, logistics and ICT. To this end, TVET institutions must be repositioned to offer modular and industry-specific programmes in both existing and future infrastructure investments. Moreover, upskilling programs aimed at informal workers can reduce the significant dividing line that today separates low-skilled labor and the new formal jobs born out of infrastructure.

One of the frustration and one of the opportunity that private sector, in terms of their role. This PPPs include; concession agreements, and blended finance models have increased the capacity of infrastructure delivery in West Africa and brought more innovation and efficiency in project execution. Employment opportunity increased due to private sector participation — in construction, during operations phase, and its supply chain / ancillary services. This has its advantages for formal business, but the informal labor force is often left out. African labor markets generally operate with higher rates of informality, and because West African workers are so highly concentrated in informal employment, any infrastructure project that does not specifically design for the incorporation of informal workers—be it through job guarantees, training schemes or regulatory inclusion risks maintaining existing inequities. Infrastructure policy needs to take account of this, develop pro-poor employment strategies, and ensure that private sector participation is guided by inclusive labor standards eroded at both in the formal as well as informal segments.

At a high level, the discussion serves as a reminder that infrastructure is a necessary condition for economic transformation, but not sufficient for inclusive or efficient labor markets. Its transformational potential will be developed when it is integrated into an overall policy framework, buttressed by human capital development and addressing both formal and informal segments of the work force. West African governments that wish to use infrastructure as a lever for labor markets transformation need infrastructure to become integrated with employment, education and enterprise development policies.

VII. POLICY IMPLICATIONS & RECOMMENDATIONS

The findings of this study offer critical insights for policymakers, development practitioners, and private sector actors seeking to harness infrastructure development as a tool for labor market transformation in West Africa. While infrastructure investments in transport and energy sectors have demonstrated potential to boost employment and productivity, their long-term success depends on deliberate policy actions that align these investments with national employment goals, education strategies, and inclusive development agendas. This section presents five interconnected policy recommendations designed to enhance the labor market impacts of infrastructure initiatives across the region.

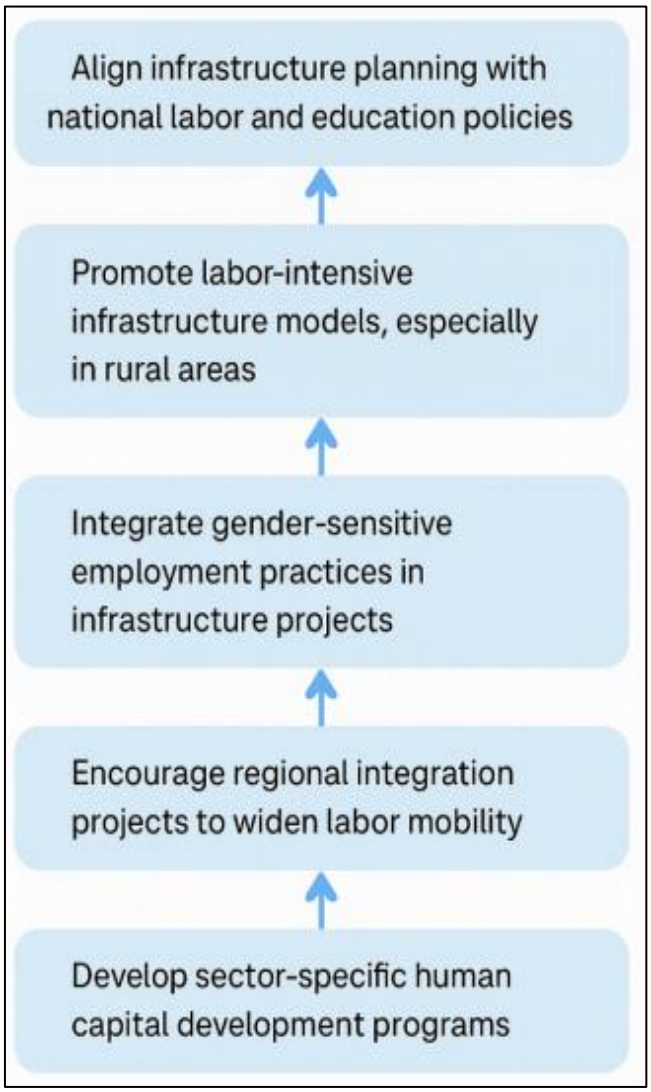

Fig 9 Policy Recommendations for Infrastructure and Labor Integration

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

This flowchart outlines five strategic policy measures to align infrastructure investments with labor market development. It emphasizes integration with national labor and education policies, promotion of labor-intensive models, gender inclusion, regional labor mobility, and sector-specific human capital programs. These recommendations aim to maximize employment benefits and improve labor market efficiency across West Africa.

For the first, there is an imperative to coordinate infrastructure planning with national labor and education policy. Infrastructure projects are framed and implemented stand-alone, and apart from human capital strategies and workforce development programs more frequently than they should. But this piecemeal delivery will mean that infrastructure will fail to serve as the key catalyst for enhanced employment and skills. States need to establish inter-ministerial linkages between the departments of works, labor, education and planning so that infrastructure projects are linked with current and future employment market needs. To illustrate, labour-market consequences and skills forecasts should be mandatory elements of all large infrastructure investments as part of national development plans, to ensure that training programs continue in parallel with the rollout of new infrastructure (Ajakaiye & Jerome 2021; Asare et al. 2023).

This will also promote labor-intensive infrastructure models, which can generate jobs for low-skilled and underemployed people in rural areas. Labour-based methods of road construction, drainage systems and rural electrification generate more employment for the US$ spent than capital intensive approaches (Boakye & Amoako, 2023) and facilitate community ownership as well as local economic activity. Governments/ development partners should give preference to labour based technologies/approaches and procurement models that will benefit the people in general, a way of preempting selection ratios in the regions where there are serious issues of employment and dependance on informal sector labour.

Third, it is essential that infrastructure development include gender-sensitive employment practices in order to foster more equitable labor market engagement. With all this in mind, women are less and less present among the infrastructure workforce on account of gender norms, occupational segregation and lack of access to training. Inclusive project design will need to provide gender-impact assessments, ensure non-discriminatory hiring practices and provide childcare facilities and flexible working options where feasible in the case of investing firms (World Bank, 2022). Further, targeted quotas or incentives for women in technical training, infrastructure construction jobs and leadership roles within public works can help narrow the gender gap to secure optimum social returns from public investments (Asare et al. 2023).

Fourth, policy makers should also promote regional integration projects to foster cross-border connections and the mobility of labor in within the sub-region of West Africa. The investment in regional transport corridors, energy transmission networks and the digital infrastructure can create new labor markets, also allowing skilled and unskilled workers to seek for job with no restriction on one hand, as well as trade in services and goods (Ebohon & Okoye with Acheampong) from coast of to region almost instantly on the other. This type of projects, the Dakar–Bamako corridor and the West African Power Pool showcase how infrastructure can be used to promote regional labor market integration which is key in a region where all but one have same economic challenges and shared labor markets. These efforts must be underpinned by harmonized national regulatory frameworks, mutual recognition of qualifications and regional labour market information systems.

Finally, there is a need to undertake targeted human capital development programs catering to the burgeoning needs of transport and energy sectors. TVET institutions should, therefore, be overhauled to deliver modular competency-based curricula which are occupation specific: railway mechanics, solar panel installer, heavy machinery operator as well in managing infrastructure logistics. Public-private partnerships can also design or assist with curriculum development, apprenticeships and job placement services to ensure that training outcomes are well aligned with labor demand (Essandoh-Yeddu, Ackom & Obeng 2022). Equally importantly, labor markets can become more inclusive if targeted upskilling programs that cater to the needs of informal workers allow them to move from informal employment into formal infrastructure jobs.

Collectively, these policy prescriptions underline the need to embed infrastructural development within a broader inclusive and concerted prism of employment generation and human capital enhancement. Infrastructure can be considered a true engine of inclusive growth only if it is planned and constructed not just as a means of physical extension but also engineered to affect transformation in the lives and livelihoods of the people it seeks to serve.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

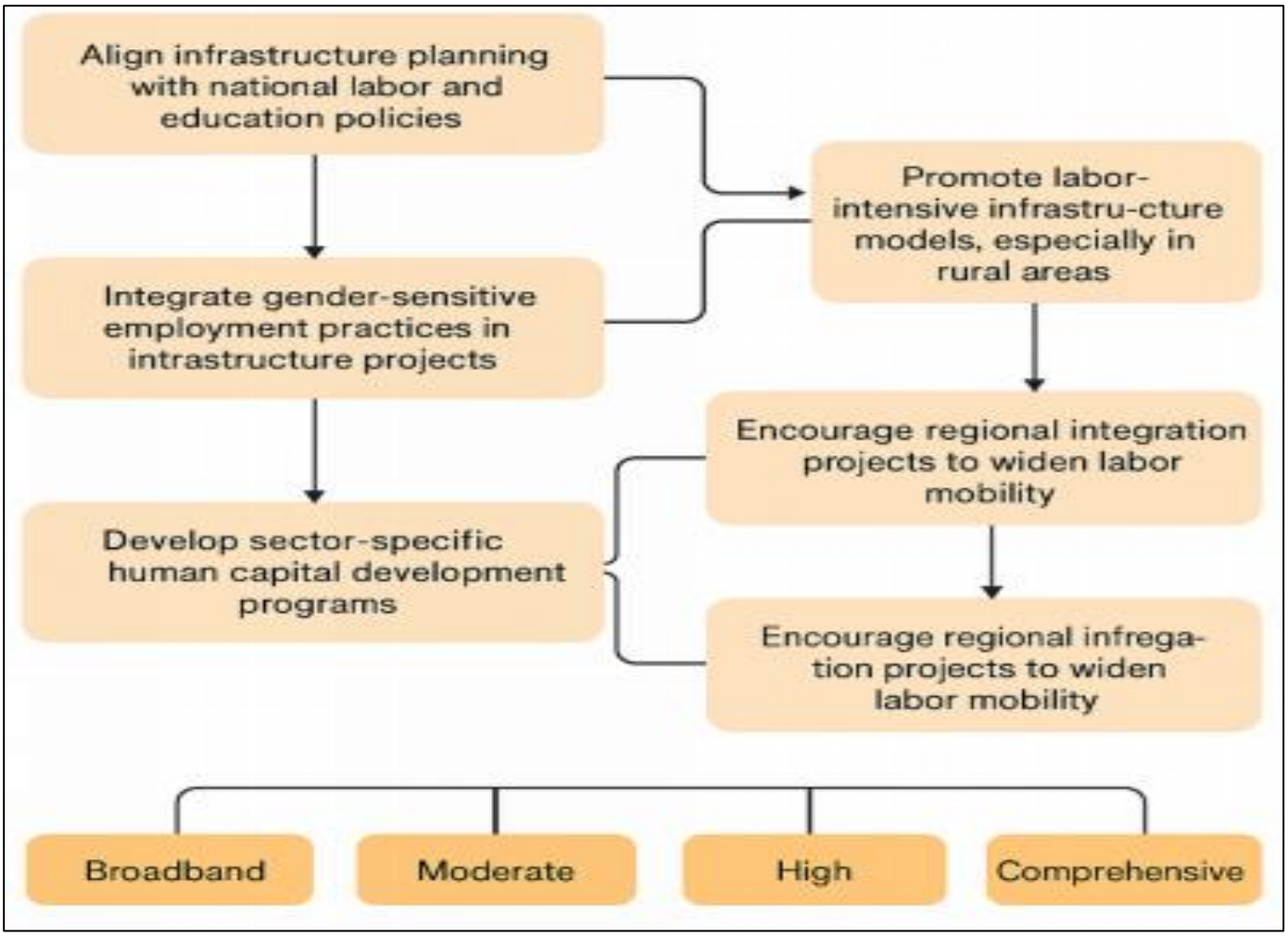

Fig 10 Integrated Policy Pathways for Infrastructure-Labor Market Synergy

This flowchart visually presents a phased approach to aligning infrastructure investment with labor and education policies. It outlines interconnected strategies—gender inclusion, regional integration, labor-intensive projects, and human capital development—culminating in scalable implementation levels. The diagram underscores how coordinated and progressive policymaking enhances infrastructure's capacity to foster inclusive and efficient labor markets across West Africa.

VIII. CONCLUSION

The present study critically surveyed the isomorphism between infrastructure development and labor market efficiency in the case of West Africa with specific reference to transport and energy sectors from 2010–2025. Findings: Based on structured review of peer-reviewed literature, institutional reports, and illustrative case examples from Nigeria, Ghana, Côte d'Ivoire and Senegal; the study shows that while infrastructure development offers significant potentials to revolutionalize labor markets; the extent of its effectiveness is strongly contingent upon existence of complementary frameworks and strategic coherence with national development priorities.

Transport infrastructure generates direct and immediate short-term employment both during the construction phase as well as trade facilitation stage, energy infrastructure takes longer time to launch but once operational, it enhances industrial productivity and expands prospects in electricity-dependent sectors. Yet the labor market returns on these investments continue to be varied throughout the region because of fragmented planning processes, skill gaps and a lack of coverage for informal workers. They also highlight the imperative to view infrastructure, not just as a horizontal of physical capital but more importantly as a pre-requisite enabler for transformational and inclusive socio-economic development.

The study draws on a plethora of theoretical lenses — Human Capital Theory, New Structural Economics, the Dual Sector Model, and the Infrastructure-Led Growth Hypothesis — to posit that infrastructure will accrue meaningful dividends to labor market efficiency when anchored in an integrated ecosystem of human capital formation, institutional harmony, and inclusive employment pathways. It also highlights the critical role of urban planning and public-private partnership in broadening the horizon (indicating range) and sustainability of infrastructure-induced job creation.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

The study finally states that infrastructure must be planned and carried out always with an eye on the labor market. Recommendations for policymakers to align infrastructure investments with national labour and education policies, adopt where appropriate, integrate gender-sensitive and inclusive employment practices, promote regional integration to enhance labour mobility, as well as sector-specific investing in human capital development programs. We must take a multidimensional and people-centered approach to infrastructure if we are to realize its potential for tackling unemployment, decent work deficits and inclusive growth throughout West Africa.

In the end, the results offer a guide to reframing infrastructure as more than just an independent goal for development into an instrument relevant to achieving inclusive labor market development. Opportunities abound for scholars to dive into the longitudinal employment outcomes associated with infrastructure projects, as well as to investigate new and necessary pathways in the financing and governing of such projects—doing so through models that place labor market inclusion hand-in-hand with infrastructure expansion.

REFERENCES

[1]. African Development Bank. (2021). West Africa economic outlook: From pandemic to sustained recovery. African Development Bank Group.

[2]. Adeosun, K., & Yakubu, M. (2021). Infrastructure investment and informal sector employment in Nigeria. Journal of African Development Studies, 13(2), 88–105.

[3]. Aguilar, J., & Goldstein, M. (2021). Infrastructure and inclusive labor market outcomes in Sub-Saharan Africa. Journal of African Economies, 30(4), 395–420. https://doi.org/10.1093/jae/ejab009

[4]. Ajakaiye, O., & Jerome, A. T. (2021). Structural transformation, infrastructure, and labor markets in West Africa. African Development Review, 33(S1), S37–S55. https://doi.org/10.1111/1467-8268.12528

[5]. Almeida, J., & Garcia, R. (2020). Infrastructure and rural labor markets: A case study of Northeast Brazil. World Development, 132, 104985. https://doi.org/10.1016/j.worlddev.2020.104985

[6]. Asare, J. K., Tuffour, J. K., & Frimpong, S. (2023). Social infrastructure and inclusive development in Ghana. Development in Practice, 33(2), 172–183. https://doi.org/10.1080/09614524.2022.2101507

[7]. Aschauer, D. A. (2019). Is public expenditure productive? Reassessing infrastructure's role in U.S. economic growth. Public Policy Review, 45(1), 27–48.

[8]. Barasa, S., & Odongo, T. (2019). Infrastructure development and informality in Kenya: An empirical assessment. Journal of Development Policy and Practice, 4(1), 20–40. https://doi.org/10.1177/2455133318820225

[9]. Boakye, D., & Amoako, C. (2023). Urban infrastructure, informality, and labor transitions in Accra. Cities, 135, 104339. https://doi.org/10.1016/j.cities.2022.104339

[10]. Chowdhury, M., & Dey, S. (2023). Electrification and labor force participation in rural Bangladesh: Gender implications. Energy for Sustainable Development, 72, 85–94. https://doi.org/10.1016/j.esd.2023.01.004

[11]. De Jong, G., & Verhoef, E. (2021). Urban transport investments and female labor supply: A spatial analysis of the Netherlands. Transportation Research Part A: Policy and Practice, 144, 29–45. https://doi.org/10.1016/j.tra.2020.12.003

[12]. Ebohon, O. J., Okoye, A., & Acheampong, R. A. (2021). Infrastructure and regional integration in West Africa: Challenges and opportunities. Habitat International, 118, 102474. https://doi.org/10.1016/j.habitatint.2021.102474

[13]. Essandoh-Yeddu, J., Ackom, E., & Obeng, G. Y. (2022). Impact of energy infrastructure on small enterprises in Ghana. Renewable Energy, 187, 1114–1126. https://doi.org/10.1016/j.renene.2022.01.098

[14]. International Labour Organization. (2021). Transforming African labour markets through infrastructure. https://www.ilo.org

[15]. International Labour Organization. (2023). Informal employment and decent work in West Africa. https://www.ilo.org

[16]. International Renewable Energy Agency. (2021). Renewable energy and jobs – Annual review 2021. https://www.irena.org/publications/2021

[17]. Kouassi, Y., & Adepoju, A. (2021). Infrastructure and employment generation: A case study of port development in Côte d'Ivoire. African Journal of Economic Policy, 28(1), 51–66.

[18]. Krause, M., & Bitter, R. (2022). Regional labor markets and the role of infrastructure: Evidence from Germany. Journal of Regional Science, 62(3), 528–552. https://doi.org/10.1111/jors.12532

[19]. Lin, J. Y. (2011). New structural economics: A framework for rethinking development and policy. World Bank Publications.

[20]. Mendoza, R., Flores, R., & Tan, M. (2020). Infrastructure and female labor market participation in the Philippines: A panel data approach. Asian Development Policy Review, 8(2), 117–134.

[21]. Munnell, A. H. (2020). Infrastructure investment and labor market responsiveness in Canada: Revisiting the productivity hypothesis. Canadian Public Policy, 46(4), 447–460. https://doi.org/10.3138/cpp.2020-017

[22]. Ogunleye, E. K., & Olayemi, O. O. (2020). Energy access and productivity in ECOWAS states. Energy Policy, 144, 111663. https://doi.org/10.1016/j.enpol.2020.111663

[23]. Organisation for Economic Co-operation and Development. (2020). Infrastructure for sustainable growth and jobs: An OECD perspective. OECD Publishing. https://doi.org/10.1787/9789264313029-en

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25aug1152

[24]. Rana, S., & Roshan, M. (2021). Energy infrastructure and SME employment in India: An ARDL analysis. Small Business Economics, 57(3), 1101–1119. https://doi.org/10.1007/s11187-020-00352-1
[25]. Schultz, T. W. (1961). Investment in human capital. The American Economic Review, 51(1), 1–17.
[26]. Toure, B., & Ba, O. (2019). Green energy and employment in Senegal: Assessing the Taiba N'Diaye Wind Farm. Energy Research & Social Science, 55, 47–56. https://doi.org/10.1016/j.erss.2019.05.012
[27]. Traoré, S. (2020). Infrastructure and cross-border labor mobility in West Africa: Insights from Mali and Côte d'Ivoire. Journal of African Integration, 5(1), 23–39.
[28]. World Bank. (2022). Africa's infrastructure performance scorecard: Regional diagnostic report. World Bank Group. https://www.worldbank.org