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The Impact of Improving Railway Station Infrastructure on Zambia's Economic Development

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Abstract

Infrastructure of railway systems plays an important role in every country's economic development, especially countries like Zambia that are landlocked and rely heavily on transport systems for economic activity and economic growth [7]. This research studies the impact of adding improvements to railway infrastructure on Zambia's economic development, focusing particularly on Railway station infrastructure. Zambia's railway systems, comprising of Zambia Railways LTD and TAZARA, is one of the oldest railway systems in Africa. It has however suffered from decades of neglect, aging infrastructure, poor maintenance, lack of modernization, lack of investment and underutilization of railway stations.

Previous studies on railway infrastructure in Africa have focused on transport efficiency and logistics. However,

fewer studies focus on the station as a civic space with social and economic impact. This research uses mixed methods of research. Using case studies of train stations and field research such as site visits, interviews with key stakeholders such as Zambia railways LTD, cargo transportation clients and rail passengers, provides insights on railways station infrastructure in Zambia.

The research findings showed that railway stations in Zambia lack commercial spaces such as restaurants, ATMs, shops etc. that can attract users beyond passengers in transit, that can contribute to economic activities [19]. This research also explores how modern and functional railway station infrastructure contributes to attraction investments, reducing transport costs, encouraging exports and creation jobs.

Keywords: Heritage Conservation, Transport Economics, Railway Infrastructure, Accessibility, Sustainable Design

1. Introduction

Zambia, being a landlocked country, is highly reliant on efficient transport systems especially railway infrastructure for trade and economic development [7]. Railway stations play a critical role in the transport network. They not only have logistical functions, but also are potential hubs of economic and social activity [1].

Railway infrastructure in Zambia has, however, been neglected for several years. This has caused a significant decline in the Rail transport industry in Zambia.

This research focuses on the economic implications of improving railway station infrastructure in Zambia. It highlights the station's potential as a public and commercial space. The study provides insights on how targeted improvements to railway stations can catalyze economic growth.

2. Literature Review

Zambia has two main railway operators, namely TAZARA and Zambia Railways LTD (ZRL). According to *Zambia Railways Facts and Figures, 1987* [6], Zambia has a total of 16 railway stations. 12 of these handle passengers and cargo- namely Lusaka, Kafue, Mazabuka, Choma, Livingstone, Mulobezi, Mpika, Kabwe, Kapiri Mposhi, Kitwe, Kasama and Ndola- while 4 of these stations are cargo only and these are Chililabombwe, Luanshya, Chingola and Mufulira. The railway sector in Zambia has faced many challenges including old Rolling Stock, dilapidated station buildings and inadequate government [8]. Though rail transport transports a significant amount of cargo, stations remain undeveloped and underutilized. Due to this under-development, the passenger train is only mostly used by school children and farm produce traders.

According to *world bank 2019* [7], efficient railway systems are important for economic development especially in landlocked countries like Zambia. Railway infrastructure facilitates the movement of goods and people at lower transportation costs and

promotes connectivity between rural and urban areas [9]. Railway infrastructure has for a long time been recognized as a driver of urban and economic development. According to [1], transport hubs are not only functional spaces but also symbols of modernization and catalysts for investment. Modern railway stations have over the years, evolved into multifunctional hubs. In countries like South Africa and Kenya, train stations include retail shops, offices and other amenities that cater for both train passengers and the surrounding communities. These models show that well planned station infrastructure can attract investment and hence, train stations are critical because they concentrate flows of people and goods, influence land values and stimulate economic activity [20].

Challenges in station Redevelopment

a. High Capital Costs

Modern station redevelopment is capital intensive and requires long term investment strategies, often necessitating public-private partnerships [15].

b. Institutional Weakness

Weak maintenance culture and insufficient technical capacity can undermine redevelopment outcomes [18].

c. Vandalism and security

African studies show that without strong security systems, modern facilities fall into despair quickly. Vandalism and theft is a huge challenge for redevelopment in Africa [17].

Although railway infrastructure is widely recognized as important for economic growth, very few research studies focus specifically on the economic potential of railway stations in Zambia. Existing research targets transport logistics, freight movement and government investment needs. This gap supports the relevance of this study, which examines railway stations as civic, commercial and economic assets in Zambia's urban landscape.

3. Methodology

This research uses a mixed methods approach:

3.1 Qualitative Methods

a. Site visits & observation

Physical assessments were conducted at Ndola, Kitwe and Kapiri-mposhi stations. The observations focused on structural conditions, accessibility, commercial activity, safety features, lighting and sanitation.

b. Semi Structured Interviews

Semi structured interviews with stakeholders including Zambia railways Ltd. Staff, passengers and cargo clients. The interviews explored themes of operational challenges, heritage considerations [13], economic opportunities and modernization needs. Semi-structured interviews provide flexibility while allowing respondents to contribute additional insights [12].

3.2 Quantitative Methods

a. Passenger Questionnaires

A total of 25 questionnaires were distributed to train passengers at Ndola and Kitwe stations. The survey measured user satisfaction, perception of safety, comfort, ventilation, sanitation, accessibility and availability of commercial services.

3.3 Secondary Data

Secondary data was obtained from National documents such as Zambia railways performance reports, ministry of Transport annual reports and Worldbank transport datasets.

Table 1: Summary of Data Collection Techniques

Method	Purpose	Tools used	Data generated
Site observation	Assess physical condition of the stations	Camera, checklist, sketchbook	Photos, sketches
Interviews	Identify user needs	Notebook	Qualitative Narratives
Questionnaires	Measure satisfaction	forms	Quantitative responses
Case studies	Compare best practices	Journals. Online sources	Comparative insights
Archival Research	Understanding heritage value	Government reports, Zambia railways archives	Historical data

4. Results & Analysis

4.1 Physical Condition of Railway Stations

More than 90% of railway stations in Zambia are in a dilapidated state beyond repair, [19]. Site observations revealed vandalized buildings, inadequate sanitation, insufficient lighting and lack of sitting areas. These conditions discourage public use and do not support economic growth.

a. User Satisfaction (Questionnaire Findings)

Findings indicate that over 80% of surveyed users rated the station environments as poor or very poor. Observations revealed broken windows and doors, vandalized waiting areas with no ventilation, limited functional toilets, poor lighting and security.

Table 2: Summary of Questionnaire Results

Indicator	% rating "poor"	Observation
Sanitation	92%	Limited functional toilets
Lighting and safety	78%	Stations were poorly lit at night, most lights were vandalized and, on some days, there was no lighting due to load shedding
Seating availability	74%	Many passengers sat on floors
Commercial services	92%	No ATMS, shops or restaurants

Many respondents expressed desire for clean seating areas, security systems, restaurants and retail shops.

b. Stakeholder Perspectives

Zambia Railways Ltd.

ZRL staff cited lack of capital investment, vandalism and outdated rolling stock as obstacles. They emphasized that modernized stations could serve as revenue generating assets. This echoes views from [2].

c. Cargo Clients

Cargo clients acknowledged that rail transport is significantly cheaper than road transport but criticized outdated facilities at the stations. A single freight train can carry up to 1,200 tons, versus a truck that can carry only 34 tons per truck. Rail reduces fuel and labour cost and lowers

transit risks. This aligns with studies on transport economics [4].

5. Discussion

5.1 Economic Impact Analysis

The following are the impacts of modernizing station infrastructure:

a. Reduce transport costs for businesses

Rail transport is more cost effective than road transport as cargo trains have a carrying capacity of 1,200 tons as compared to a truck that can only carry up to 34 tons. This reduces cost of fuel and man power.

b. Reduction of carbon emissions

Modernizing rail stations can encourage use of rail transport and this can help reduce road cargo, therefore reducing carbon emissions. Carbon emissions impact the economy in many ways. They bring about climate change which leads to natural disasters like droughts and floods. This results in costs for disaster response. Climate change can also negatively affect human health, leading to increased demand for costly healthcare services.

c. Attracts private investment

Commercial developments and real estate that surrounds the station also gains revenue when the station is modernized. A developed station further attracts investments such as retail chains, property developers, hospitality serviced and banking institutions. This aligns with transit-oriented development (TOD) principles [10].

d. Creates Jobs

Through construction, retail and other newly introduced amenities, new jobs are created. Re-developing train stations can create 3,000-4000 jobs in the supply chain if ZRL sourced most of the locomotive parts, components and services from businesses in Zambia [19].

These align with the national development goals outlined in Zambia's 8th National Development Plan (GRZ, 2022), which highlights infrastructure modernization as a growth catalyst.

6. Conclusion and Recommendations

Improving railway station infrastructure in Zambia has strong economic benefits. Railway stations are more than transit points, they can be dynamic economic hubs that attract investment and create employment. However, without strategic planning, investment and stakeholder engagement, these potentials remain unexploited.

6.1 Recommendations

- a. *Policy reforms* to prioritize station redevelopment in national infrastructure strategies.
- b. *Public-Private Partnerships (PPPs)* to fund station upgrades and incorporate commercial facilities.
- c. *Capacity building* within Zambia Railways to manage and maintain Modern infrastructure.

With strategic interventions, Zambia's railway stations can play a transformative role in the country's economic future.

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