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THE IMPACT OF ROAD TRANSPORTATION NETWORK ON PRODUCTIVITY AND GROWTH IN KENYA 50 YEARS AFTER INDEPENDENCE: A REVIEW

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Abstract

Kenya celebrated her 50 years of independence on the 12th December 2013 with economic and policy analysts jotting that in that period the economy had grown nine times. It is a proven fact that development and maintenance of physical infrastructure are prerequisites for rapid economic growth and poverty reduction, as they influence production costs, employment creation, access to markets, and investment. Despite being considered an economic powerhouse in the East and parts of Central Africa Economic block, the size of the roads network, which is perceived to be fairly well developed, has suffered from numerous setbacks. Among these are; inadequate maintenance, repair and rehabilitation (MR&R), and the fragmentation of the institutional framework within which it is managed. This paper aims to provide a review of challenges the Kenyan government has faced on its road network, the impact of the state of the road network on productivity and growth, and the interventions proposed within the 50 years of her independence. This paper is based on an exploratory review of literature on the state of road networks and its effects on Kenya productivity and growth. Inferences from the reviewed literature indicate that the state of road network in Kenya causes delays, breakages and high maintenance cost for transport machinery, leading to high costs of doing business. This has resulted in the concentration of industries in areas with good road network thus creating disparities in regional industrial development. However, the government of Kenya has been developing road polices to improve on the road network. Given that the findings reported herein are inferences deduced from material reported in literature, the factual correctness of some of the intricate indices may not be explicitly verified. However, the general facts may be implied by the existing state of affairs. The paper presents the identified probable causes that have slowed the development of road network in Kenya including their impact and interventions proposed or implemented by the government of Kenya. It expresses an objective overview on literary discourse around the road network in Kenya. The study advocates for policies that will lead the country to achieve her development strategic plan of Vision 2030 on road network development, which the authors view as a catalyst to address the endemic systemic inadequacies that have stifled prudent infrastructure management strategies in the past 50 years of independence.

Keywords: Impact, Productivity, Roads, Network, Development

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1. Introduction

The transport and telecommunication infrastructure subsector in Kenya contributed the highest to the gross domestic product (GDP) of the country for three consecutive years, from 2008-2011. In 2012 it also contributed the highest to the GDP at 9.3% (Kenya Institute for Public Policy Research and Analysis report (KIPPRA, 2013). The subsector also provides the necessary linkages for promoting national and international trade, economic growth, poverty reduction and wealth creation. Road transport accounts for over 90% of Kenya's total passenger and freight transportation (African Development Bank Group, (ADBG, 2014). Kenya experienced rapid expansion of road infrastructure in the late 60's and 70's, largely as a result of high levels of development assistance from bilateral and multilateral agencies (Kasuku and Macharia, 2003).

Since the 1980's, there has been a drastic reduction in support and absence of alternative funds for routine maintenance despite the stated importance of the road sector and the previously experienced rapid expansion. This led to a considerable deterioration of roads, both classified and unclassified. The deterioration of roads has been cited one of the probable reasons for the decline of Kenya in regional competitiveness in trade, industry and commerce (Kasuku and Macharia, 2003). While there is heavy reliance on road transport in Kenya, of the 160,886-km road network of both classified and unclassified, only 7% of this network is paved. This is not economically sustainable as the road network carries 90% of freight and passengers. The total length of paved roads per 10,000 inhabitants in Kenya is currently estimated at 2.19 km, which is less than the East Africa Community member countries' average of 2.53 km (African Development Bank Group, 2014). Recent surveys also suggested that about 50% of the road network in Kenya is in good condition while the balance requires rehabilitation (Ministry of Transport (MoT, 2010)). Similar studies also report that about 30% of Kenya's population live within two kilometres of an all-weather road. This percentage is considered to be well above the benchmark for low-income countries, but only half the level found in middle-income countries (Briceño-Garmendia and Shkaratan, 2010).

Furthermore, the road network, density and conditions vary across the country, which should be addressed (Kenya Institute for Public Policy Research and Analysis report (KIPPRA, 2013). These road networks are overlaid on major settlements as indicated in Figure 1. They are concentrated in the highlands of South Western Kenya. These are the agricultural heartland and areas of highest population density. The highways, primary, secondary and feeder roads are in the Southwest, near Lake Victoria (Briceño-Garmendia and Shkaratan, 2010; de Sherbinin, Adamo and Sydor, 2013). The dryer Northern areas of Kenya are far more sparsely populated and the road networks are less dense. Although some roads are coded as highways, these are in reality mostly two-lane paved roads. Tertiary roads are generally little more than dirt roads or tracks. Furthermore, the World Health Organization indicated that Kenya was ranked 25th highest in the world for the total number of road traffic deaths in 2010 and 45th in road death rate (deaths per 100,000 population) (de Sherbinin, Adamo and Sydor, 2013).

Based on the aforementioned discussion of the importance and shortcomings of the road network in Kenya, the purpose of this paper is to establish the challenges that the Kenyan government has faced pertaining to road network development 50 years after independence. It also envisages to outline the intervention strategies that have been implemented or proposed as a deliberate effort to realign the infrastructure development strategies to the country's grand Vision 2030 strategic blueprint. In this blueprint, the economy is enshrined as one of its three pillars. The economy is consequently expected to be driven by among other factors; prudent road infrastructure development policies. Hence, the following research questions were proposed:

- What challenges has the Kenyan government faced on its road network 50 years after independence?
- What has been the impact of road network on productivity and growth 50 years after independence? and
- What interventions have been proposed to enhance positive impacts or mitigate against the negative impacts?

2. Literature review

2.1 Challenges of Kenya Road Network

Various transport policy statements are contained in various documents including the National Development Plan (2000-2008), the Poverty Reduction Strategy Paper (PRSP), the Kenya Economic Recovery Strategy, the National Alliance Rainbow Coalition (NARC), Orange Democratic Movement manifesto and vision 2030 blueprint. According to Kasuku and Macharia (2003), generally, commitment to a strategic and broad-based approach to transport planning is gauged by the extent to which a country's roads policies are based on the following fundamental criteria:

- Integration—ensuring that all roads decisions are taken in the context of a coherent, integrated transport policy covering all modes;
- Accessibility—making it easy to reach destinations;
- Safety—making travelling safer;
- Economy—getting good value for money and supporting sustainable economic activity in appropriate locations;
- Environmental impact—both positive and negative, on both the built and the natural environments, and at the global, regional and local levels; and
- Tackling road congestion.

Against these criteria, the issue that has affected road transport sector in Kenya as cited by Kasuku and Macharia, (2003) is lack of coordination that is; it is difficult to coordinate the activities of the various road agencies, to determine their financial requirements, and to address the problems of the road sector in a synchronized manner. The general high value of roads as compared to railways and air travel provides a *raison-d'être* for ensuring coordinated management with access to adequate funds to ensure the large investments in roads yield value-for-money operations. However, funding estimates have been far higher than what is available and allocations from government resulting in inadequate maintenance and rehabilitation of roads. This has led to most paved and unpaved roads to deteriorate

significantly through a lack of maintenance, repair and rehabilitation. Furthermore, the main paved road networks are being overloaded by vehicles. Besides the overload, traffic growth has resulted in a substantial network of unpaved roads carrying traffic levels that would otherwise justify paving the roads. In this regard, it is estimated that about 2,500 km of unpaved roads carry over 200 vehicles per day. Congestion has also been deemed a challenge, particularly in major urban areas that are characterized by heavy congestion during peak hours, over-loaded public transport vehicles, speeding, and reckless driving. Consequently, the cost of road transport in Kenya has been considered to be extremely high as a result of physical damages and death incurred through accidents. It is estimated that the average death rate on Kenyan roads is approximately seven persons a day comparable to the Netherlands which has a similar rate but its vehicle density is at least 10 times higher than Kenya's. Kasuku and Macharia (2003), also state that lack of a comprehensive and integrated transport policy framework implies that the overall policy framework does not consider the impact on land use, the natural environment and local public finance. Sustainable development demands that the country must develop a road policy strategy that accounts for other transport sectors and the overall development concerns of efficiency, equity and environmental sensitivity.

In a study conducted by Winiecki, (2008) the current state of roads outside of Kisumu particularly the main artery connecting the city with Nairobi and Mombasa is the biggest infrastructure constraint to business activity in Kisumu. Two thirds of respondents (14/21) recognized poor quality of roads as the most detrimental infrastructure limitation preventing their businesses from reaching their full potential. The study further attributes the poor state of major roads in Kenya to the following: low levels of government investment in road construction and maintenance thereof; high levels of heavy-truck traffic on the Mombasa-Nairobi-Kisumu route carrying goods that could otherwise reach destinations in Western Kenya and other East African countries via rail and lake transport, if appropriate investments were to be made on the appropriate modes of transport; and politically motivated spending of scarce transportation infrastructure ring-fenced resources in politically correct regions of the country.

Odero and Njenga, report (2005) indicated that there is no maintenance policy for Kenyan roads despite apportioning specific road classes to particular agencies. Furthermore, the report states that revenue for road maintenance remains a challenge due to the level of resources in the constituency development funds which was insufficient for rural roads and other transport infrastructure. It is their recommendation that such funds should be increased to sufficient amounts so as to meet the targeted maintenance goals. They further discerned other pitfalls among them; the lack of adequate quality control in road execution, misuse of road facilities, lack of adequate research in roads and related systems as well as lack of delivery systems for comprehensive routine maintenance of Kenya's roads. These challenges are further exacerbated by limited finance to implement the road polices effectively.

The Kenya Rural Roads Authority report (2012-2013) indicated that the challenges experienced in managing rural access roads were mostly competency related. In the report, it was identified that the constitution of the constituency roads committees were

inappropriate and inept. The membership of such committees included a number of technically inexperienced members with little knowledge of procurement laws and regulations. Consequent to such ineptitude were the following: increased overhead costs, less cooperation from local authorities over road works, large conflict of interest due to bigger groups involvement, inadequate supervision capacity, the transition into the devolved government structures, and challenges of road classifications into national and county roads among others.

Briceño-Garmendia and Shkaratan (2010) indicated that Kenya faces a huge rehabilitation backlog that must be addressed before the trunk network can be considered to be in a maintainable condition. As of 2006, the level of capital spending for the roads sector in Kenya was approximately 1% of the GDP. This was low by regional standards and fell substantially short of what would be needed to clear the rehabilitation backlog in a reasonable period of time. There is a need for a one-time push on road sector investment to remedy this situation. Systemic issues further affect the country's public investment system. These will need to be addressed to ensure that any major scale-up in capital expenditure is cost-effective. Road investments have been characterized by low rates of budget execution (about 60% of the 2006 budget was spent), cost overruns of as much as 80% over engineering estimates, and lengthy delays that tend to double the implementation period. Furthermore, inadequacies in the system for supervising construction contracts have compromised on quality and shortened the design life of road networks.

Furthermore, according to the Ministry of Transport (MoT, 2010), heavy traffic congestion was identified as a challenge especially during peak hours, and stiff competition for limited road space among motorists, pedestrians and cyclists. Traffic congestion is further manifested in long queues of slow-moving vehicles and long waiting times, particularly in Nairobi and Mombasa. Poor physical planning has led to scarcity of parking space in the Central Business District, especially in Nairobi.

The Ministry of Roads (MoR, 2012) identified challenges gazetted in the road sub-sector policy document. These challenges included: non implementation of the drafted Integrated National Transport Policy which was prepared in 2009, hence led to the lack of integration of transport modes; lack of a national spatial plan that resulted in haphazard development; the available funds currently for development and maintenance of roads are inadequate, therefore a substantial part of the road network is not sufficiently attended to, resulting in huge maintenance backlog.

Apart from the identified challenges, there are also concerns over sustainability of Road Maintenance Levy Fund given the emerging issues relating to consumption of petroleum products by non-road users. The report also indicated that there exists an inappropriate modal split, that is; according to the Nairobi Urban Transport Master Plan study carried out in 2006, walking of pedestrians' accounts for 47% of the modal share in Nairobi, hence non-motorised transport facilities have not been adequately provided. Low volume of public service vehicles are inordinately high (29%) as compared to the high volume vehicles (4%), thus increasing traffic congestion and reducing efficiency. Road safety management is also fragmented across various institutions, therefore resulting in poor coordination which leads

to high numbers of road accidents. Lack of effective road classification system is in existence, given the provisions of the Constitution. Other challenges were: capacity, that is; institutional and technical know-how, lack of axle load control, road reserve encroachment, high cost of land acquisition, high cost of hire of road construction plant and equipment, inadequate legal framework for private sector participation, and volatility of foreign exchange to road network investment.

The African Development Bank Group (ADBG, 2014) suggested a number of challenges which continue to undermine the sustainability of investments in the transport sector in Kenya. Key among these are: funding shortfalls which has resulted in a maintenance backlog estimated at about 20-30%; overloading, notably on major highways; inadequate institutional capacity for road maintenance, especially for the newly established devolved agencies; and continued lack of road safety. Despite these challenges, some governance issues in the transport sector persist including: lack of clarity in division of responsibility amongst transport related institutions governed by the Kenya Roads Board (KRB); weak accounting systems and record management coupled with lengthy procedures for payments; inadequate stakeholder participation in decision making, inappropriateness and ineffectiveness of the institutions in the sector; and absence of proper complaint mechanism. The road network with the neighbouring countries is under pressure, because of the poor road condition. Furthermore, the devolution process which came into effect upon the promulgation of the new constitution in 2010 is underway but faces challenges. This is exacerbated by human capacity constraints and large budget deficit.

2.2 Impact of road network on growth and productivity

It is a proven fact that development and maintenance of physical infrastructure are prerequisites for rapid economic growth and poverty reduction, as they influence production costs, employment creation, access to markets, and investment. However, the First Medium Term Plan (2008-2012) to enable achieve Vision 2030, supported by the Ministry of Industrialisation (2010), indicated that the poor and dilapidated state of transport infrastructure in Kenya has led to low productivity, high production and distribution costs and uncompetitive products and services. Further, the road networks in Kenya are concentrated in a few urban areas, with limited feeder roads in regions with resources endowments. This has resulted in the agglomeration of industries in areas with good road networks thus further creating disparities in regional industrial development. According to the Ministry of Industrialisation (2010) the poor state of the road network causes delays, breakages and high maintenance cost for transport machinery leading to high costs of doing business. This has also resulted in the concentration of industries in areas with a good road network thus creating disparities in regional industrial development.

The MoT, (2010) indicated that the inefficiency in urban transport due to poor road infrastructure has resulted in high transport costs for both passengers and goods. The majority of low-income urban workers currently find public transport costly and financially inaccessible and hence meet most of their transportation needs through walking and head loading. Some of them, however, risk their lives by utilising non-motorised and intermediate means of transport (NMIMTs) (especially bicycles, motorcycles and "*mikokoteni*" i.e. hand

pulled carts). In addition to poor road conditions in the urban areas, there is a lack of other road infrastructural facilities like footpaths for pedestrians, lack of separate lanes for cyclists or Non-Motorised Transport modes (NMIMTs). Past experience shows that transport policies have largely supported motorised transport at the expense of non-motorised transport and have denied the poor and disadvantaged benefits inherent in NMIMTs leading to marginalisation of NMIMT users in both urban and rural areas.

The ADBG (2014) indicated that family farming has been characterised by low productivity due to inadequate rural roads including other infrastructure components. Furthermore, police road blocks and multiple weighbridges continue to slow the traffic flow and create bribery and corruption opportunities.

2.3 Government of Kenya response to the road network challenges

In an attempt to respond to the challenges faced by the road sector in Kenya. The Ministry of Roads (MoR, 2011), indicates that the government introduced the Road Maintenance Levy Fund in conjunction with the establishment of the Kenya Roads Board (KRB). These initiatives were to fund and manage the road sector respectively. As a further step to facilitate better service delivery, the government established the Kenya National Highways Authority (KeNHA), Kenya Rural Roads Authority (KeRRA) and Kenya Urban Roads Authority (KURA). These agencies were established in order to assist the KRB to manage the different classified roads in Kenya. It is reported that throughout the reform process, the Ministry of Roads (MoR) has shown great commitment and leadership.

According to the Kenya Institute for Public Policy Research and Analysis report (KIPPR, 2013) the roads sub-sector has been receiving increased budget resource allocation for construction of new roads, bridges, rehabilitation of roads and periodic maintenance as an intervention to improve the road network condition.

Kasuku and Macharia (2003) and supported by Odero and Njenga, (2005) indicated that the GoK in response to the challenges facing the road sector indicated the need to focus in reducing the unit costs of transportation through; infrastructure improvement by coordination of road development and maintenance. This is to ensure that the road network is maintained rehabilitated and or upgraded and expanded to rural areas. Other focus areas identified include: Improvement on road safety and the reduction of congestion in urban areas and on main roads through dualling, fly-over, tunnel grids and bypasses in the main town, and the use of labour based technology for employment creation and foreign exchange savings. Regarding the later for instance, the Rural Access Roads Programme (RARP), initiated in 1974 by the Government was in realisation of the need to place more emphasis on the developmental impacts of road improvements in rural areas. The initiative was based on the premise that rural access roads (mainly unpaved) could contribute immensely towards the acceleration of growth and fostering a more equitable distribution of income in the rural areas. The RARP therefore aimed to provide all-weather access between the farming areas and the market centres and at the same time create employment opportunities by employing labour intensive construction and maintenance techniques. By 1978, a total of 2,500 kilometres of rural access roads had been constructed. This strategy according to Odero and

Njenga culminated to the Roads 2000 strategy. In addition to the aforementioned focus area, addressing the issue of financial viability and sustainability of fees, to increase funding and ensure adequate cost recovery for efficient and continued maintenance of the road network are also key areas that need immediate attention.

The ADBG (2014) cited the different intervention the Government of Kenya (GoK) has instituted or proposed. For example in 1999 the GoK established through an Act of Parliament, the Kenya Roads Board (KRB), with a specific mandate to oversee the development and maintenance of the country's road network. The KRB's source of funding is the fuel levy, which has grown fourfold since 2000 with annual collections reaching Ksh 22.5 billion (~USD 0.26 billion) in 2013. Furthermore, the GoK has also initiated other measures to improve the sustainability of road investments, notably the use of performance based contracting, whereby newly constructed or rehabilitated roads are placed under a long term maintenance scheme, and outsourced to a private contractor, with payments based on service delivery. The Kenyan construction industry has geared towards professionalism by instituting the National Construction Authority alongside other non-executive agencies and professional associations. In addition, weighbridge operations on core networks are also outsourced to the private sector so as to enhance efficiency in the regulation of axle loading on the roads. The government has started to introduce road tolling of heavily trafficked highways, such as the Nairobi-Thika Highway. A public private partnership (PPP) framework has also been adopted to lay ground for private sector participation in road development and maintenance. The banks' report suggests that the GoK is considering a further increase in the fuel levy to generate additional revenue required to reduce the road maintenance backlog; and to create an enabling environment for the private sector participation under PPP arrangements. Furthermore, KRB and the National Treasury are planning to float an infrastructure bond to mobilise additional funding for road construction and maintenance.

The ADBG (2014), further indicated that the GoK continues to address transport sector governance issues by taking various actions that include: the outsourcing of weighbridge management and operations to the private sector; setting up of independent tender committees within each road authorities to oversee procurement processes and to ensure that the processes are consistent with best international practices; training of staff from all road authorities on procurement, financial management, and in contract management, so as to address fiduciary issues; separation of the role of engineer and employer in civil works contracts to avoid conflict of interests; and integrating Technical and Value for Money audit services as components in road projects to ensure value for money to the road users and the Government. In line with the aforementioned interventions observed by the AFDB (2014), the Bank has assisted the GoK's efforts to improve governance in the sector by providing finance for recruitment of procurement and financial management specialists for the Kenya National Highway Authority (KeNHA) and professional training to all road authorities in procurement and financial management. The Bank has also introduced Value for Money audits, in addition to the technical audits, for all Bank road projects approved by the Board since 2011. The Bank is also under discussion with KeNHA to reduce non value adding steps in the payment processes.

3. Research methodology

A literature review was undertaken based on facts and findings as documented in conference papers and proceedings, journals, professional reviews and government reports to discern and collate the relevant information regarding the challenges of road network in Kenya and their probable impacts on productivity and growth for the past 50 years of her independence. The review also identified methods used to improve the state of the road network in Kenya. In order to address the aforementioned challenges the following research objectives were set:

- To identify the challenges faced by the Kenyan government on its road network implementation 50 years after independence;
- To determine the impacts of the state of road network on productivity and growth for the past 50 years of independence; and
- To identify the interventions instituted by the Kenyan government to improve the state of the Kenyan roads 50 years after independence.

4 Findings and discussions

4.1 Challenges faced by Kenyan government on Roads network 50 years after independence

Road sector challenges continue to undermine the sustainability of investments in the Kenyan transport sector, 50 years after her independence. Several challenges have been identified that contribute to the current state of affairs. Among the key challenges established include the following: funding shortfalls which have resulted in maintenance backlog estimated at about 20-30%; overloading, notably on major highways; inadequate institutional capacity for road maintenance, established fragmented agencies; poor planning of the urban road network which leads to congestion, lack of an efficient integrated road network locally, including the neighbouring countries and continued lack of road safety.

4.2 The impact of the state of the road network

Where the road network is in a good condition, it acts as a pull factor for development and consequently there is bound to be an agglomeration of industries in such areas and probably an enabling environment for businesses to thrive, thus creating disparities in regional industrial development. In contrast, poor state of the road network causes delays, breakages and high maintenance cost for transport machinery leading to high costs of doing business. The poor state of the roads coupled with a misaligned transport and traffic regulatory mechanism cultivates a favourable breeding ground for corrupt practices in a bid to do business at all costs irrespective of flouting the rules. This manifest boldly when the law enforcement agencies resort to bribery especially at designated checkpoints (roadblocks) that are meant to ensure the rules and regulations of the road are adhered to. Such rules include: passenger capacity in public transport vehicles, axle loading, and speed limits among others.

4.3 Kenyan government interventions on road network challenges

In recognition of the various challenges and effects of the state of road network, the Kenyan government is considering to increase the fuel levy with a view to generate additional revenue required to reduce the road maintenance backlog; and to create an enabling environment for the private sector participation under private public partnership (PPP) arrangements. Furthermore, KRB and the National Treasury are planning to float an infrastructure bond to mobilise additional funding for road construction and maintenance. These proposals are supported by the ADBG (2014).

5. Conclusions

Road transportation is an essential component for the transportation of raw materials, industrial inputs, finished products and movement of human capital. In Kenya it accounts for over 90% of the total movement of passengers and freight, hence a key infrastructural component for Kenya productivity and growth. It is the only means of access to majority of rural communities in Kenya. In addition, the importance of road infrastructure has been highlighted in the Vision 2030 blueprint. This long-term development blueprint, aims to transform the country into a newly industrialised, middle-income country that provides a high quality of life to all citizens by 2030. However, this discourse had identified different challenges that the government of Kenya has experienced in her first 50 years of independence, for example poor planning of the urban road network which leads to congestion, lack of an efficient integrated road network locally, including the neighbouring countries and continued lack of road safety, poorly maintained roads due to lack of adequate funding, incapacity of employees to name but a few. These challenges have led to negative effects on the road network usage. Such effects include: delays due to congestion on roads, transit and time losses incurred when sending farm produce to the market among others. These have led the government to improve on her management of the road networks by creating the Kenya Roads Board with three subordinate agencies to assist in the development and maintenance of the different categories of roads.

6. Recommendations

In Kenya, like in most sub-Sahara African countries, roads are managed by government departments. The Department of Infrastructure and Transport which is the department in Kenya responsible for roads network should play a major role in order to ensure vision 2030 is achieved. As we start another half century after celebrating 50 years of independence, Kenyans would love to see a better 50 years in her road network. In order for this to be achieved this paper proposes the following recommendations to be incorporated with the current road policy:

- Political good will from the politicians;
- The government should delink the development of Master plans from politics in order to formulate blueprints that reflect a futuristic and collective realm;
- The government agencies that have been formulated with the Kenya Roads Board should perfect the implementation of the roads projects and should be honest with their implementation;

- Employ qualified and competent personnel in the government agencies;
- Ensure proper design of road networks with a futuristic forecast of population growth and the resulting expansion and or development needs;
- The government should ensure transparency on the award of contracts, including the duration of contracts; and
- Ensure the devolution system, of managing road networks within the counties and see to it that they are properly implemented.

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