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Research Paper

Evaluating The Role of Safe System Approach Adoption in Road Traffic Fatality Reduction in Sub-Saharan Africa

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Abstract: *Road traffic fatalities remain a persistent and disproportionate burden in Sub-Saharan Africa despite the region's relatively low motorisation rate. This study evaluates the role of the Safe System Approach (SSA) in mitigating road traffic fatalities and severe injuries across the region: Road traffic safety management in Nigeria, South Africa, Ethiopia, and the Democratic Republic of Congo were critically examined.The SSA centred on principles of shared responsibility, human vulnerability, and systemic resilience has shown considerable success in high-income settings. However, implementation in Sub-Saharan Africa faces substantial hurdles, including institutional fragmentation, limited resources, infrastructural deficits, behavioural challenges, and data limitations. Using qualitative content analysis and trend data from WHO, FRSC, and RTMC, this study assesses both global contributions of SSA and its regional adoption challenges. The findings reveal that while SSA aligned strategies have been introduced in varying degrees, their impact remains constrained by governance, enforcement inconsistencies, and conceptual ambiguity among stakeholders. The study underscores the need for greater policy coherence, funding mechanisms, and cultural shift to support systemic road safety reforms. If effectively contextualised and resourced, the Safe System Approach holds significant promise for reversing the upward trajectory of road fatalities across the region.*

Keywords*; Safe System Approach, Road Traffic Fatalities, Sub-Saharan Africa, Road Safety Policy, Institutional Capacity*

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I. INTRODUCTION

Road traffic injuries (RTIs) and fatalities pose a significant global concern, with an estimated 1.19 million lives lost annually due to road traffic crashes, and an additional 20-50 million road users sustaining non-fatal injuries worldwide (World Health Organization, 2023). Disparities in road safety persist, with Low and Middle-Income Countries (LMICs) specifically, in Sub- Sharan Africa where Road traffic deaths are a significant concern. According to the World Health Organization's (WHO) 2023 report, nearly 250,000 lives were lost on African roads in 2021, with the region accounting for about one-fifth of global road deaths despite having only 15% of the world's population and 3% of its vehicles, bearing a disproportionate burden. Notably, some nations have achieved significant reductions in road fatalities, whereas others lag behind.

It is widely acknowledged that human error constitutes a significant proportion of contributory factors in road crashes, with estimates suggesting approximately 90% of incidents are attributable to such factors (Shinar, 2019). However, this prevailing view has been subject to critique, with some arguing that the assumption that solutions should directly address the perceived cause is overly simplistic. A more nuanced approach is required to identify the multifaceted causes of road traffic fatalities and develop efficacious countermeasures.

The Safe System Approach offers a promising framework for addressing road safety, prioritising the prevention of fatalities and serious injuries (European Commission, 2022). This approach recognises that human error is an inherent aspect of driving, but crashes do not necessarily have to result in severe harm (ITF, 2016). By combining multiple policy measures and interventions, the Safe System Approach can effectively mitigate the risk of road fatalities.

The Safe System Approach (SSA) is a globally endorsed framework for reducing road traffic fatalities and serious injuries. It emphasizes shared responsibility among system designers and users and recognizes human vulnerability and error as critical factors in designing safer roads. Despite its promise, implementing the

SSA is challenging, particularly in sub- Saharan Africa countries. Addressing these challenges is essential for tailoring the approach to specific socioeconomic and institutional contexts.

The prevailing narrative attributing road fatalities primarily to driver error oversimplifies the complexities of road safety (WHO, 2021; Lisa, 2022; Job et al., 2022). Driver mistake often represents the final link in a chain of events leading to a crash, with other critical factors, such as vehicle design and infrastructure vulnerabilities, frequently contributing to the outcome (WHO, 2021). Overemphasising road-user error may divert attention from addressing underlying systemic weaknesses in the causal chain, thereby limiting the effectiveness of safety interventions (ITF, 2018). In contrast, the Safe System approach, also referred to as Vision Zero, has garnered significant support among road safety experts and governmental authorities (Job, 2017; Bjornberg et al., 2022; ITF, 2022). This approach acknowledges the multifaceted nature of road safety and seeks to mitigate the risk of crashes through a holistic understanding of the interplay between human, vehicle, and infrastructure factors. The key principles of the approach can be summarized as follows:

According to ITF (2022), the Safe System approach is underpinned by four key principles

a. Individuals commit mistakes or errors that have the tendency to result in collisions. The transportation system must be built to accept the possibility of human mistakes and the inherent unpredictability of human behaviour or actions.

b. The human body possesses a recognised and finite capacity to endure collision forces before sustaining injury. In order to prevent fatal or serious harm, it is necessary to restrict the impact forces that occur during a crash.

c. Responsibly is shared: It is incumbent upon individuals to use caution and adhere to traffic regulations. There is a collective obligation among road and vehicle designers, builders, managers, and users to prevent accidents that lead to severe injuries or fatalities and to ensure efficient post-crash treatment.

d. It is necessary to reinforce all components of the system collectively in order to amplify their impact and guarantee the continued safety of road users even in the event of a failure in one component.

Road safety persists as a significant public health and developmental challenge in Sub-Saharan Africa, where the region experiences disproportionately high rates of road traffic fatalities globally (WHO, 2023). Despite having relatively low levels of motorisation, the region is beset by frequent and severe road crashes, which are compounded by infrastructural deficiencies, inadequate enforcement, and behavioural issues. The adoption of the Safe System Approach (SSA), widely implemented in high-income countries, presents a paradigmatic shift in road risk management (ITF, 2016; Saferpour et al, 2022; Bjornberg et al, 2022). By acknowledging the inevitability of human error and designing transport systems that are resilient and forgiving, the SSA offers a departure from traditional models that focus on apportioning blame, instead prioritising a more holistic and proactive approach to road safety.

II. AIM AND OBJECTIVES

The study explores the role of the Safe System Approach (SSA) implementation in preventing road traffic fatalities and serious injuries in Sub-Saharan Africa. This will be achieved with the following objectives:

I. to identify the perceived global contribution of the Safe System Approach to road safety.
II. to examine efforts toward implementing the SSA in Sub-Saharan Africa.
III. to identify challenges to implementing the SSA in Sub-Saharan Africa.
IV. to analyze road traffic fatalities in Sub-Saharan Africa.

III. LITERATURE REVIEW

3.1 Perceived global contributions of Safe System Approach to road safety

The Safe System approach has been successfully implemented in various countries, including the Netherlands, Sweden, Norway, and Australia, resulting in significant reductions in road fatalities and injuries (Bjornberg et al., 2022; Elyse et al., 2024). For instance, the Netherlands' implementation of the Safe System strategy led to a 30% decrease in road fatalities in 2007, attributed to measures such as reduced speed limits, categorisation of highways, and increased enforcement of risk factors (European Commission, 2023). Similarly, Sweden's Vision Zero initiative resulted in a 50% reduction in fatalities, achieved through measures like speed limit reductions, speed cameras, and enhanced road infrastructure (Lindberg & Hakanson, 2017).

In Australia, the Safe System approach was adopted in 2004 and has served as the foundation for all road safety practices, action plans, and strategies (Alavi et al, 2023). However, a 2021 Victorian parliamentary inquiry found that the implementation of the Safe System approach in Victorian road and transport management was inadequate, leading to its failure in preventing severe injuries on highways (Alavi, 2023).

The success of the Safe System approach has inspired numerous countries and localities to adopt similar strategies, including Canada, Norway, the United States, Poland, and the United Kingdom (Bjornberg et al, 2022). In the United States, the Vision Zero programme has led to significant reductions in traffic deaths,

with states like Minnesota, Utah, and Washington experiencing decreases of 43%, 48%, and 40%, respectively (Safarpour et al, 2020b).

Norway's implementation of the Safe System approach has also yielded positive results, with a substantial increase in the reduction rate of traffic fatalities, from 2.1% per year between 1970 and 2000 to 6.1% per year between 2001 and 2017 (European Commission, 2023). Studies have shown a significant reduction in fatality and severe injury rates among road users in Norway following the implementation of Vision Zero (Elvik and Tor-Olav, 2023).

The adoption of the Safe System concept has been endorsed by global organisations such as the United Nations, World Health Organisation, World Bank, International Transport Forum, and Stockholm declaration (UN 2022; ITF, 2022; WHO, 2023). These organisations have urged countries, particularly low- and middle-income countries, such as sub -Saharan Africa to adopt and implement the Safe System approach to achieve a global reduction in road fatalities and severe injuries (ITF, 2022; WHO, 2023).

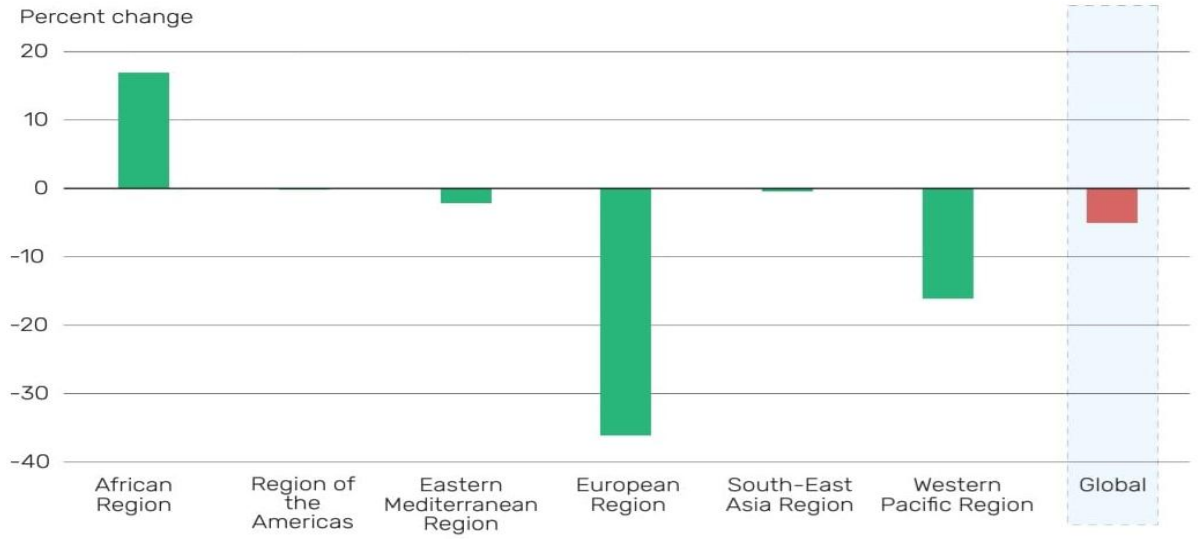

Figure 1: Percentage change in estimated road fatalities, 2010 – 2021(WHO, 2023)

Fig 1 illustrates the percentage change in road traffic fatalities across six (6) World Health Organization (WHO) regions, alongside a global average. The data reflects a comparative analysis between 2010-2021. The African Region stands out as the only WHO region that has recorded a positive percentage change, estimated at around 17%, indicating a substantial increase in road traffic fatalities over period. This upward trajectory is highly concerning and suggests that road safety efforts in the continent are not only stagnating but regressing in relative terms. The data underscores a widening gap between Africa and other global regions in terms of road safety performance. In contrast, the European Region demonstrates the most notable success, exhibiting a reduction of over 30% in road traffic fatalities. This significant decline reflects the region's long-standing investment in comprehensive road safety strategies grounded in the Safe System Approach, effective enforcement mechanisms, high vehicle safety standards, and well-established emergency response systems. Europe's performance illustrates the potential effectiveness of data-driven, multi-sectoral interventions when backed by strong political commitment and institutional capacity. 5% reduction in global road traffic deaths was also observed. Notably, the most significant declines were reported by countries that have successfully implemented the Safe System Approach, primarily European nations (WHO2023).

3.2 Effort Towards the Implementation of the SSA in sub-Saharan Africa

The Safe System Approach (SSA) represents a paradigm shift in road safety, moving away from traditional focused strategies towards systemic, people centred interventions that acknowledge human fallibility and seek to build a resilient road system (ITF, 2022). This approach is structured around key pillars namely; safe roads, safe speeds, safe vehicles, safe road users, and post-crash care while prioritising five critical behavioural risk factors: excessive or inappropriate speed, alcohol-impaired driving, non-use of helmets, non-use of seatbelts, and absence of child restraints (Peterson, 2022; WHO, 2023). In Sub-Saharan Africa, countries such as South Africa, Nigeria, Ethiopia, and the Democratic Republic of Congo (DRC) are at various stages of implementing SSA principles, with differing levels of success.

South Africa

South Africa has demonstrated a strong commitment to SSA, with its National Road Safety Strategy (2016–2030) explicitly integrating Safe System principles, including shared responsibility, forgiving road environments, and systemic resilience (Department of Transport, 2016). The country has implemented various measures to enhance road safety, such as average speed cameras and Intelligent Transport Systems (ITS) (Arrive Alive, 2021). Additionally, South Africa has enforced laws related to drink-driving, with legal blood alcohol concentration (BAC) limits of 0.05g/dL for general drivers and 0.02g/dL for professional drivers (Peden et al., 2020). However, challenges persist in enforcement, equitable access to safe infrastructure, and behavioural change among users. Despite these challenges, South Africa's commitment to SSA is evident in its formal policy frameworks and institutional capacity.

Nigeria

Nigeria has made progress in adopting SSA principles, with the development of the Nigeria Road Safety Strategy I (2011-2020), NRSS II (2021-2030), and the establishment of the National Road Safety Advisory Council (NaRSAC) (Olagunju, 2018; Osinbajo, 2021). The Nigeria Road Safety Strategy aims to reduce road traffic crashes and fatalities through a multi-sectoral approach, involving stakeholders from transport, health, education, and enforcement agencies. Nigeria has also implemented measures such as speed limiters for commercial vehicles, which were mandated by the Federal Road Safety Commission (FRSC) in 2017 (Niniola, 2022). However, challenges persist, including device tampering, ineffective enforcement, and limited public awareness. In addition to speed limiters, Nigeria has introduced emergency response systems, including the Emergency Ambulance Service Scheme (EASS) and the National Community Post-Crash Care Initiative (NCPCCI). These initiatives aim to improve post-crash care and reduce the severity of injuries (FRSC, 2023). However, implementation remains constrained by institutional inertia, socio-political instability, and infrastructural deficits. Nigeria's road safety efforts are further hindered by limited resources, inadequate enforcement, and cultural attitudes that undermine road safety. Despite these challenges, Nigeria's commitment to SSA is evident in its efforts to strengthen institutional frameworks and promote road safety awareness. The country has also seen incremental progress in implementing SSA aligned measures, such as improved road infrastructure, safe to load programme, public awareness campaigns and education programmes targeting motorcyclists and commercial vehicle operators in addition with enforcement strategy,

Ethiopia

Ethiopia, despite having one of the lowest motorisation rates, reports high road traffic fatalities, reflecting systemic vulnerabilities in its road safety architecture (World Bank, 2021). The country has initiated pilot projects to implement safer infrastructure design and traffic management in urban areas, aligning with SSA principles (WHO, 2021). Ethiopia's Road Safety Strategy (2021–2030) shows a growing alignment with SSA principles, with a focus on reducing crash severity and improving post-crash care (World Bank, 2021). However, Ethiopia remains in the early stages of systemic road safety reform, with limited financial resources, weak institutional frameworks, and competing national priorities.

The Democratic Republic of Congo

The DRC presents a complex context, with ongoing political instability, conflict, and weak governance (WHO, 2022). While there is no national SSA strategy, fragmented interventions by NGOs and international donors occasionally incorporate SSA-aligned elements, such as pedestrian infrastructure in Kinshasa(Kayisu et al, 2024). The country requires significant external support and internal reform to lay the groundwork for SSA implementation. Despite these challenges, the DRC has seen incremental SSA aligned efforts, including behavioural change campaigns and education programmes targeting motorcyclists and commercial vehicle operators (Safarpour et al, 2022).

The SSA offers a compelling vision for road safety transformation in Sub-Saharan Africa, with positive contributions increasingly apparent (ITF, 2022). As more governments and institutions commit to these principles, the potential to drastically reduce road traffic fatalities and injuries grows stronger, contributing not only to safer mobility but to broader goals of social equity and sustainable development.

3.3. Challenges of Safe System Approach Implementation in sub Saharan Africa.

The Safe System Approach (SSA) offers a transformative and holistic framework to reduce road traffic deaths and serious injuries, premised on the assumption that human errors are inevitable, but road systems can be designed to prevent such errors from resulting in fatalities (Elyse et al, 2024). While high-income countries have demonstrated considerable progress through SSA principles, Sub-Saharan Africa home to some of the world's highest road traffic fatality rates faces unique and formidable challenges in embracing and operationalising this approach. These challenges are rooted in deep-seated structural, economic, cultural, and institutional issues.

a) Institutional Weaknesses

Many Low- and Middle-Income Countries (LIMCs) experience disjointed institutional structures, insufficient coordination, and limited capacity to enforce road safety laws(WHO, 2023). Agencies responsible for road safety often lack clear mandates, adequate funding, or technical expertise. One of the most significant impediments to the successful implementation of the SSA in Sub-Saharan Africa is the prevalence of institutional fragmentation and governance weaknesses. In Sub-Saharan Africa, road safety responsibilities are dispersed among multiple ministries and agencies with overlapping or unclear mandates. For instance, while one agency may be charged with traffic law enforcement, another oversees transport infrastructure, and yet another handles emergency response often without effective coordination or shared accountability frameworks (Peden et al., 2020). Furthermore, many road safety institutions are lack access to up-to-date training, technologies, equipment and research. As a result, enforcement remains reactive rather than preventive, with limited capacity for strategic planning or cross-sectoral collaboration.

b) **Limited Financial Resources**

Elvik & Naevestad (2023) noted that Implementing the Safe System Approach(SSA) requires significant investment in infrastructure, technology, and training. The SSA is an investment-intensive model that requires sustained funding across a range of domains, including road infrastructure upgrades, vehicle safety systems, data systems, education campaigns, emergency medical services, and capacity-building initiatives. Unfortunately, most Sub-Saharan African countries operate within tight fiscal environments, where resources are diverted to pressing issues such as health, education, food security, and political stabilisation (World Bank, 2022).In this context, road safety often receives minimal budgetary allocation, despite its high socio-economic cost. Investments in safe road design, for example, are frequently overlooked in favour of cheaper, short-term infrastructure developments that do not account for human vulnerabilities. Similarly, public transport reform, road safety audits, and intelligent transport systems (ITS) which are critical to the SSA remain rare due to financial constraints.

c) **Rapid Urbanization and Poor Infrastructure**

The pace of urbanisation in Sub-Saharan Africa is among the fastest globally. While urban growth presents economic opportunities, it has also resulted in serious infrastructure deficits. Cities such as Lagos, Nairobi, Kinshasa, and Addis Ababa struggle to provide formal, planned, and safe transport systems for their rapidly expanding populations. Consequently, informal transport operators such as minibuses, motorcycles and tricycles thrive in the absence of efficient public transport alternatives (UN, 2021).

This growth in unregulated transport modes exacerbates road safety risks, especially in the context of unpaved roads, poorly marked intersections, insufficient pedestrian crossings, and a general lack of segregated infrastructure for vulnerable road users (. Moreover, road maintenance is often inadequate, with potholes, poor drainage, and inadequate signage posing daily threats to road users. In rural areas, the situation is often more dire, with roads that are impassable or unsafe, particularly during rainy seasons. Such conditions run counter to SSA principles, which call for forgiving and predictable road environments (World Bank. 2022)..

d) Cultural and Behavioral Factors

A persistent cultural and behavioural challenge undermines the adoption of the SSA in Sub-Saharan Africa. Compliance with road safety laws is generally low, not only due to enforcement gaps but also due to widespread social attitudes that de-emphasise risk. Many drivers do not perceive speeding as dangerous, motorcycle riders frequently disregard helmet laws, and vehicle occupants rarely wear seatbelts particularly in the rear seats (WHO, 2023).

These behavioural trends are often grounded by a lack of sustained public awareness campaigns and minimal emphasis on road safety education or driver training programmes. Road safety behaviours are not deeply embedded in societal values, and this gap is compounded by enforcement regimes that are either punitive and corrupt or altogether absent (Peden et al. 2020; UN 2021). In the absence of visible, consistent, and credible enforcement, traffic laws fail to shape behavioural norms, thereby weakening the human element that is vital to the SSA's effectiveness. such as wearing helmets by riders, seatbelts by all occupants of a vehicle, or adhering to speed limits. These attitudes are sometimes compounded by limited public awareness and weak enforcement strategy (WHO, 2022).

e) **Stakeholders Perception and Conceptual Ambiguity**

There are various descriptions of the Safe system concept which has implication on stakeholder understanding, interpretation and implementation of the SSA (Elyse et al, 2024). The SSA's conceptual nuance poses another layer of challenge in the region. Although the approach is internationally recognised, its philosophical and operational underpinnings are not uniformly understood by stakeholders within African road safety ecosystems. Many decision-makers and practitioners still operate within traditional models of road safety

management, which focus on driver responsibility rather than systemic failure or shared accountability (Job, 2022).

This lack of clarity leads to inconsistent implementation and fragmented adoption. While some stakeholders may interpret the SSA as a call for infrastructural reform, others see it primarily as a behavioural campaign. Such divergence in interpretation undermines the coherence of national road safety strategies and makes inter-agency collaboration difficult. Furthermore, without a strong lead agency or regulatory body to promote and guide SSA principles, the approach risks being diluted or abandoned in favour of more familiar but less effective interventions.

f) Vehicle Safety and Standards

The quality and safety of vehicles on African roads present yet another obstacle to SSA implementation. In many Sub-Saharan African countries, the automobile market is dominated by second-hand imports, often sourced from countries with stricter emissions and safety standards. These vehicles typically lack basic safety features such as airbags, anti-lock braking systems (ABS), or electronic stability control (ESC) (Global NCAP, 2019).

Safarpour et al (2022) asserts that regulatory frameworks for vehicle safety are often weak or non-existent in some Low and- middle income countries. Vehicle inspection regimes, where they exist, are sporadic and prone to corruption. As a result, vehicles that are mechanically unfit and structurally unsafe continue to operate on public roads with impunity. Additionally, public service vehicles are frequently modified in ways that compromise their structural integrity or exceed recommended passenger capacity, thereby increasing crash severity. This undermines SSA's pillar of safe vehicles and puts all road users particularly vulnerable road users such as passengers and pedestrians at heightened risk (Shinar, 2019: peterson, 2022)..

g) Post-Crash response

Post-crash response systems in developing region, specifically in Sub-Saharan African are often inadequate, with insufficient ambulances, trained personnel, or communication infrastructure. Emergency medical services (EMS) are often underfunded, poorly equipped, and geographically limited. Rural and peri-urban areas frequently have no access to ambulances, and when available, response times are delayed due to traffic congestion, poor road conditions, or lack of communication infrastructure (Jomroz et al, 2019; WHO, 2023).

The lack of efficient trauma centres and trained emergency personnel further exacerbates mortality and morbidity outcomes. In many cases, crash victims are transported by private vehicles or left unaided for hours, which significantly reduces survival chances. Furthermore, the absence of reliable, disaggregated, and timely data on road traffic crashes inhibits evidence-based policy-making. Without comprehensive crash and injury surveillance systems, it becomes impossible to monitor trends, evaluate interventions, or set realistic targets, all of which are essential to the SSA. A significant percentage of road crash fatalities in African region occur due to delays in receiving critical care. Lack of trauma centers further worsens outcomes(ITF,2022)

h. Data Limitation and Incomplete Crash Reporting

A core pillar of the Safe System Approach (SSA) is the use of empirical evidence to inform interventions, track progress, and continuously refine strategies. However, in many Sub-Saharan African countries, the lack of reliable, comprehensive, and timely data on road traffic crashes and injuries remains a profound obstacle to effective policy formulation and monitoring(Hendrie et al, 2021). In much of the region, road traffic data collection is heavily reliant on police and traffic agencies reported crashes. These records are frequently fragmented, inconsistently gathered, and plagued by underreporting. Minor crashes, near-miss incidents, and non-fatal injuries are seldom recorded, while fatalities are often misclassified or missed entirely especially if the victim dies enroute to hospital or days after the crash (WHO, 2022). The absence of harmonised data collection protocols among police, health services, and road safety agencies, leads to parallel systems with little coordination.

Addressing these barriers requires a concerted, cross-sectoral, and long-term effort. National governments must be supported to build institutional capacity, secure sustainable funding, reform regulatory systems, and foster a cultural shift towards safer road use. Moreover, international donors, development agencies, and research institutions have a vital role in supporting data systems, pilot programmes, and technical training. Ultimately, if Sub-Saharan Africa is to achieve the transformative impact envisaged by the SSA, the road safety agenda must be elevated to a national and regional development priority.

IV. METHODOLOGY

The study adapts exploratory research method. Secondary data from world health Organization, Federal Road Safety Corps (FRSC) and Road Traffic Management Corporation (RTMC) were also employed for the study. The study therefore used qualitative contents analysis and quantitative content analysis. Also, trend analysis was employed.

V. DISCUSSION OF FINDINGS

Nigeria

Nigeria represents one of the most complex road safety environments in Sub-Saharan Africa. The country reports between 5,000 and 6,000 road traffic deaths annually according to official data from the Federal Road Safety Corps (FRSC), WHO (2023) reported an estimated road traffic mortality rate of 17.2 deaths per 100,000 population.

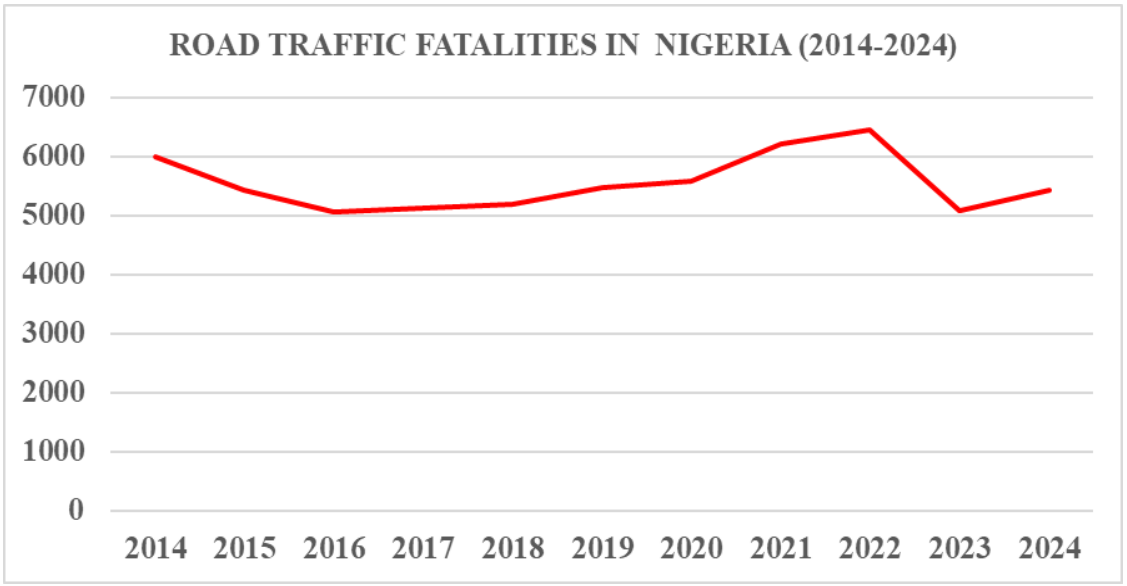

Figure 2: Road traffic deaths in Nigeria (2014-2024). (FRSC, 2024)

fatalities exhibit a relatively stable pattern, hovering between 5,000 and 6,000 deaths annually in Nigeria as shown in Fig2. However, this relative stability should not be mistaken for improvement, as it reflects a persistent burden of road traffic deaths, with minimal sustained reduction over the decade. The number of fatalities remains somewhat consistent, around the 5,000 mark. This period likely reflects the inertia of existing road safety interventions which, although present, may not have been comprehensive or strongly enforced.

Between 2018 and 2022 there was a gradual rise in fatalities, peaking slightly in 2020. This may be linked to increased vehicular movement, lax enforcement of traffic laws, or deteriorating road conditions, as Nigeria's road infrastructure has faced strain from urbanisation and insufficient maintenance. 2021 to 2022 an upward trajectory of road traffic fatalities was observed, reaching one of the highest points in the decade. This period corresponds with a post-COVID-19 recovery phase where restrictions on movement were lifted, potentially leading to increased traffic volumes and crash severity. Additionally, it may reflect a rise in unsafe road user behaviour or weakened institutional monitoring. There was a slight dip in fatalities in 2024 compare to 2023. The data also showed that a total number 61,011 people were killed as a result of road traffic crashes within the period,

Pedestrians and passengers are the most affected groups, with high fatality rates recorded on major highways connecting cities such as Lagos, Kaduna, Abuja, and Port Harcourt. In recent years, the FRSC has sought to introduce technology-based solutions such as speed limiters and digital enforcement tools. Nonetheless, challenges persist due to infrastructural decay, corruption, lack of strict enforcement and limited public awareness (Chidubem et al., 2021).

South Africa

South Africa presents one of the most documented and data rich environments for road safety in Africa. As of the latest estimates, the country records approximately 12,000 to 14,000 road traffic deaths annually, translating to a road traffic mortality rate of 19.39 deaths per 100,000 population (RTMC, 2023). The demographic most affected includes young males aged 20–39 years, with pedestrians constituting over 40% of all road deaths (RTMC, 2022).

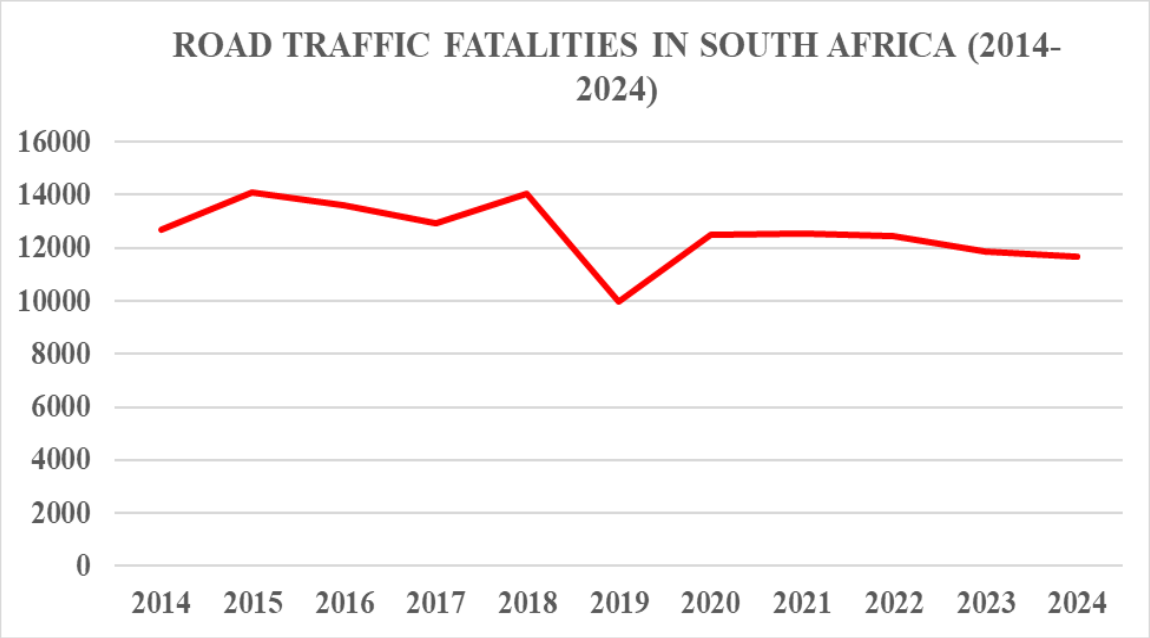

Figure 3: Road traffic deaths in South Africa (2014-2024)

The depicting Road Traffic Fatalities in South Africa (2014–2024) as reported by Road Traffic Management Corporation (RTMC) shows fluctuating but persistently high death rates over the ten-year period, with a cumulative total of 138,327 lives lost due to road traffic crashes. The trend begins with approximately 12,800 fatalities in 2014, rising to over 14,000 by 2015 and 2018, indicating a troubling peak. However, 2019 marks a significant drop to around 10,000 deaths, possibly reflecting targeted interventions, changes in reporting, or short-term enforcement measures. This decline was short-lived, as the figures rebounded in 2020 to pre-2019 levels, remaining relatively stable until 2022 before declining slightly again in 2023 and 2024 to just above 11,500.

Despite some minor fluctuations, the data reveals no sustained downward trend in fatalities across the decade. The persistent high fatality rate underscores systemic challenges in road safety, such as inconsistent enforcement of traffic laws, limited public transport alternatives, risky driver behaviour, and insufficient post-crash emergency response.

The causes of road fatalities in South Africa are multifaceted. Speeding, alcohol impairment, distracted driving, and failure to use protective equipment such as seatbelts or helmets are prevalent. The country's extensive road network and relatively high motorisation rates further exacerbate crash risk (Venter & Sinclair, 2019). The high cumulative death toll calls into question the effectiveness of existing road safety strategies and highlights the need for South Africa to fully adopt a Safe System Approach prioritising safe roads, safe speeds, safe vehicles, and safe road users while improving institutional coordination and data-driven policymaking.

Ethiopia

Ethiopia's road safety challenge is marked by rapid motorisation in urban areas, an expanding but under-regulated transport sector, and limited institutional capacity. Although Ethiopia has fewer vehicles per capita compared to South Africa and Nigeria, its road fatality rate is one of the highest globally, standing at approximately 17.7 deaths per 100,000 population (WHO, 2023). The annual number of reported deaths is estimated to range between 4,000 and 5,000, though actual figures are likely higher due to underreporting and weak surveillance systems (World Bank, 2021).

Rural areas, where road infrastructure is often rudimentary and traffic law enforcement is scarce, account for a significant share of fatalities. Additionally, large commercial trucks and public transport vehicles are frequently involved in high-casualty crashes due to mechanical failures and driver fatigue. Pedestrians, especially schoolchildren and the elderly, are disproportionately affected in urban centres such as Addis Ababa. The government has partnered with international organisations, such as the World Bank and Bloomberg Philanthropies, to improve road safety outcomes. Programmes have included speed control initiatives, road safety audits, and driver training reforms. However, systemic weaknesses, such as poor institutional coordination and limited funding, continue to limit impact (Venter & Sinclair, 2019)..

The Democratic Republic of Congo (DRC)

The DRC faces a unique and critical road safety situation. Owing to decades of political instability, conflict, and economic underdevelopment, its transport system remains highly fragmented and largely informal. WHO estimates suggest a road traffic mortality rate of 16.3 deaths per 100,000 population, though national figures are severely lacking due to unreliable or non-existent reporting systems (WHO, 2023). Road conditions in DRC are among the poorest in the world. Many major routes are unpaved, and road signage or lighting is rare outside major cities like Kinshasa and Lubumbashi (Nangana et al,2016). Public and freight vehicles are often in poor mechanical condition, and driver licensing regimes are weakly regulated. The situation is further compounded by the frequent use of unroadworthy motorcycles for both goods and passenger transport, especially in conflict affected zones (Kayisu et al, 2024). The country lacks a comprehensive national road safety strategy or central road safety agency which undermines sustainability. In practice, road traffic fatalities in the DRC remain an invisible epidemic, lost amidst the broader developmental crisis (WHO, 2022).

Road traffic fatalities in Sub-Saharan Africa remain alarmingly high and deeply rooted in systemic vulnerabilities. South Africa, Nigeria, Ethiopia, and the DRC exemplify the complex interplay between infrastructure, enforcement, human behaviour, and institutional response. What unites countries in the sub Saharan Africa is a persistent challenge in addressing structural and behavioural road safety risks. Institutional fragmentation, data gap, corruption, underinvestment, and limited public awareness are pervasive issues that hinder progress. Reducing road traffic fatalities in these countries will require a multifaceted strategy: improving data collection, strengthening institutions, enforcing traffic laws equitably, and investing in safe infrastructure. International support, particularly in technical capacity and funding, will remain essential. However, national ownership and localised intervention must be at the core of any sustainable road safety agenda.

VI. CONCLUSION AND RECOMMENDATIONS

This study confirms that the Safe System Approach (SSA), although conceptually robust and globally endorsed, has yet to achieve its transformative potential in Sub-Saharan Africa. Road traffic fatalities remain unacceptably high across Nigeria, South Africa, Ethiopia, and the Democratic Republic of Congo due to systemic constraints ranging from infrastructural inadequacies and institutional weaknesses to lack of political will and deep-rooted cultural barriers. The implementation of SSA in the region remains fragmented and poorly resourced, with limited cross-sectoral coordination and low public adherence to traffic laws. The study further reveals that while South Africa and Nigeria have made structural attempts to mainstream SSA principles, challenges relating to enforcement, behavioural compliance, and financial sustainability continue to inhibit tangible progress. Ethiopia and the DRC, though still at early stages, require substantial international and regional support to strengthen institutional capacity and embed SSA within broader transport and development frameworks.

Flowing from the study, governments in Sub-Saharan Africa must establish empowered central road safety agencies, invest in robust data systems, promote culturally informed public education, enhance emergency response capabilities, and secure sustainable funding through national and international partnerships. A robust, context-specific application of the SSA rooted in political commitment, evidence based policymaking, and coordinated multi-sectoral engagement is vital for delivering meaningful and lasting reductions in road traffic deaths and serious injuries across Sub-Saharan Africa.

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