

THE ONE HEALTH INTERFACE IN ROAD CONSTRUCTION ON THE KASOA-WINNEBA ROAD: PROCESSES, OUTCOMES, AND IMPACTS

Introduction

Road construction is essential for economic development, connectivity, and trade. However, its impact extends beyond infrastructure development, affecting human health, the environment, and social systems. The One Health approach, which recognizes the interconnectedness of human, animal, and environmental health, provides a useful framework for understanding these interactions. Road construction significantly influences air quality, human well-being, and ecosystem stability, often leading to health complications such as respiratory diseases and environmental degradation.

The construction of the road involves 16 kilometres of service roads, the construction of interchanges at Budumburam, Awutu Bereku and Akotsi junctions, as well as a flyover at Sapato all along the Kasoa-Winneba road. It also includes the construction of 16 footbridges, 15 box and 51 pipe culverts, and walkways. Extra service lanes would also be provided at all entry points to the main dualized road to assist commercial drivers in picking up and dropping off passengers. When completed, the project is expected to resolve unacceptable travel times, uncontrolled access to high-speed roads, unsafe pedestrian crossing, reduced traffic and a high threat of head-on collisions.

This discussion explores the processes occurring at the interface of road construction and their possible outcomes, citing real-world examples of health-related problems associated with construction activities.



Figure 1: State of the Kasoa-Winneba road near Budumburam as a result of dualization project.

Physical Health Impacts

Road construction involves extensive excavation, vehicle emissions, and dust generation, all of which influence public health. One of the most immediate physical health consequences is increased air pollution, which results from the release of fine particulate matter and chemicals from construction materials and heavy-duty machinery. Exposure to these pollutants can lead to respiratory diseases, such as asthma, bronchitis, and long-term lung conditions. Additionally, walking and increased physical activity due to diversions and roadblocks may have both positive and negative effects. While some individuals may benefit from increased exercise, others, particularly those with pre-existing health conditions, may struggle with the inconvenience and exposure to environmental hazards.

A notable disease linked to road construction is *Coccidioidomycosis* (Valley Fever), a fungal infection caused by *Coccidioides* spores released into the air when soil is disturbed. This disease has been reported in California and Arizona, particularly in regions undergoing large-scale infrastructure projects. It is a self-limiting illness with symptoms including fever, cough, and fatigue, and in severe cases, the infection can spread to internal organs, making it severe especially in immunocompromised individuals. So far there have been no reports of the disease in the area where the road construction is ongoing. However, there is a need for surveillance and monitoring for associated health implications.

Mental Health Impacts

Beyond physical health, road construction also influences mental well-being. The prospect of a well-developed road system may instil a sense of progress and accessibility among the population. However, the construction process itself can lead to stress, anxiety, and sleep disturbances. Prolonged exposure to noise pollution from heavy-duty vehicles and construction equipment has been linked to hypertension, stress, and reduced cognitive function.

Studies in Europe and China have shown that residents living near major construction projects often report increased psychological distress. Additionally, traffic congestion and road diversions may cause frustration and reduced productivity, further exacerbating mental health issues.

Social Impacts

The construction of international road networks like the one in this subject of discussion, fosters trade and economic growth, particularly by facilitating the movement of goods from rural to urban areas and beyond the borders (Ivory Coast). However, the temporary disruption of transport systems can have significant social implications. Farmers and traders relying on smooth road access may experience economic losses, while residents may avoid visiting family and friends due to transportation difficulties.

One common issue is vehicles refusing to ply under-construction roads, causing hardships for daily commuters. In some cases, prolonged construction projects have led to rural isolation, affecting communities that depend on social mobility for education, healthcare, and employment access. If not managed properly, these disruptions can lead to declining social cohesion and reduced economic opportunities for affected populations.



Figure 2: Heavy traffic on the Kasoa-Winneba road as a result of the dualisation project

Environmental Impacts

The environmental effects of road construction are profound, often leading to air pollution, biodiversity loss, and ecosystem disturbances. One major concern is the release of spores and aerosols into the atmosphere, which can increase the prevalence of airborne diseases. Additionally, heat and dust generated by construction activities can alter local climate conditions and impact surrounding vegetation.

Another significant issue is soil degradation and deforestation, which often accompany road expansion projects. The removal of trees and vegetation not only disrupts wildlife habitats but also contributes to erosion and desertification. In Brazil and Africa, studies have shown that road construction through forests has created breeding grounds for mosquitoes, leading to an increase in malaria outbreaks. Water contamination from construction site runoff can also introduce pollutants into rivers, negatively affecting aquatic life and water quality for surrounding communities.



Figure 3: Some environmental effects caused by the road dualization project on the Kasoa-Winneba road.

Conclusion

Road construction is a necessary component of urbanization and economic development, but it comes with significant health, social, and environmental challenges. The One Health perspective emphasizes the need for a holistic approach to infrastructure development, considering the interconnected effects on human, animal, and ecosystem health. While improved road systems offer long-term benefits, mitigation strategies such as dust control, eco-friendly construction methods, and community engagement are essential in minimizing the negative impacts. By integrating health-conscious planning and environmental conservation, societies can ensure that road construction serves as a tool for progress without compromising public health and ecological integrity.

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