



The Daily Star
CELEBRATING
33
years of
JOURNALISM WITHOUT
FEAR OR FAVOUR

BANGLADESH ON THE WORLD STAGE

SEGMENT 1

ANNIVERSARY SUPPLEMENTS 2024

DHAKA THURSDAY FEBRUARY 15, 2024

FALGUN 2, 1430 BS

22



The transformative potential of the Karnaphuli Tunnel extends to the movement of goods and services between Chittagong and Cox's Bazar, two economically crucial centres.

The completion of the Karnaphuli Tunnel is expected to revolutionise transportation dynamics in the Chittagong region, fostering efficient movement of goods and services.

PHOTO: STAR

Karnaphuli Tunnel and Padma Bridge construction

The vision of building a sustainable and developed Bangladesh by 2041

MD SHAMSUL HOQUE

The Karnaphuli Tunnel, an ambitious project, seeks to enhance connectivity in the southeastern part of Bangladesh, bridging the gap between Chittagong and Cox's Bazar. Approved in 2016, this underwater tunnel is designed to span the Karnaphuli River, aiming to reduce travel time and traffic congestion. Positioned strategically as a vital link between the east and west banks of the river, it plays a key role in the government's vision for regional integration and improved accessibility, particularly to the

Chittagong as a pivotal economic hub.

The transformative potential of the Karnaphuli Tunnel extends to the movement of goods and services between Chittagong and Cox's Bazar, two economically crucial centres. By streamlining transportation, the tunnel is anticipated to facilitate trade operations, contributing significantly to overall economic growth. Furthermore, improved connectivity holds promise for the tourism sector, providing easier access to Cox's Bazar, renowned globally for its extensive beach. This increased accessibility is anticipated to



Dr. Md Shamsul Hoque is a professor of civil engineering at Bangladesh University of Engineering and Technology (BUET).

the anticipated transformative impact. Additionally, it is crucial to evaluate the prudence of the decision to construct this tunnel.

PLANNING ISSUES

The decision to opt for a river-crossing tunnel over a bridge presents inherent challenges, both in terms of construction cost and ongoing maintenance. The justification for choosing a capital-intensive tunnel is rooted in concerns about siltation and potential obstruction to ship movements due to strong tidal forces, as well as the scour that could threaten bridge piers. However, this decision seems to overlook the viability of long-span arch, suspension, and cable stayed bridges, which many countries prefer for their cost-effectiveness, environmental friendliness, and sustainability in addressing sedimentation and ship movement issues.

Several weaknesses and planning issues associated with the Karnaphuli Tunnel project include:

1. Ventilation and lighting challenges: The confined structure of the tunnel requires constant artificial ventilation and lighting, adding to construction and operational expenses. Safety and emergency response systems, including passive fire detection and fighting systems and pumping-based drainage systems, contribute to its energy-intensive and resource-intensive nature. The tunnel's operational reliance on costly ICU-like ventilation and lighting systems raises questions about its sustainability, particularly when compared to more modern and eco-friendly alternatives.

2. Cost disparities: The Karnaphuli Tunnel, featuring a shorter diameter and 4.9m headroom instead of the standard 5.5m, comes with a cost that is approximately 1.5 times that of the high-standard double-decker Padma Multipurpose Bridge (PMB). The significantly higher life cycle cost, where the operation and maintenance (O&M) expenses are nearly 3.5 times more

expensive than that of PMB, contradicts the principles of sustainable development and national conservation policies, particularly considering the tunnel's higher energy and safety requirements.

3. Toll differentials and financial viability: Road users of the Karnaphuli Tunnel are burdened with tolls 2.5 to 6 times higher than those using the existing Shah Amanat Bridge, raising concerns about the project's financial viability. The significant toll differential poses challenges in attracting the forecasted number of tunnel users and achieving the expected socio-economic return.

4. Lack of provisions for local traffic and integration with master plans: The tunnel lacks provisions for local traffic, including pedestrians, bicycles, CNG, and motorcycles. It does not integrate with the twin-town masterplan, hindering inclusive development and accessibility. The absence of a universal access-controlled lane and interchange facilities further restricts its compatibility with local traffic needs.

5. Access restriction and safety concerns: The tunnel's adoption of a 4.9m headroom, deviating from the RHD standard of 5.5m, raises concerns about access restrictions for certain heavy cargo laden vehicles, including those carrying flammable materials. The screening-based entry system, coupled with higher toll rates, poses obstacles to tunnel accessibility and its productivity. Safety concerns related to elephant crossings and potential conflicts with beach-bound pedestrian movements further diminish its operational capacity.

6. Conflict with climate resilience guidelines: The tunnel, with at-grade approach roads not only conflict with beach-bound pedestrian movements but also does not align with national climate-resilient infrastructure development guidelines for coastal fronts experiencing sea-level rise and land subsidence issues.

7. Limited capacity and aesthetic shortcomings: The

tunnel's twin-tube configuration limits its capacity expansion, preventing the implementation of reverse or tidal flow operations during peak hours. Additionally, tunnels are less visually appealing compared to iconic bridges, missing an opportunity to create a landmark structure that attracts tourists and generates non-operational revenue streams.

8. Preference for long span bridges in harbour channels: The absence of bridges with spans greater than 200m in Bangladesh overlooks the global preference for long-span bridges in harbour channels. The choice of a costly tunnel is considered justifiable only in extreme cases where bridge construction is unviable and unavoidable, such as when crossing mountains, historically sensitive areas, or where a sea-crossing bridge is exposed to frequent high-intensity storms. Otherwise, based on cost and operational advantage considerations, a long-span bridge is the best recommended and affordable sustainable solution, similar to the Karnaphuli Channel, which is 800-1000m wide at the mouth.

EXAGGERATION OF EXPECTED BENEFITS OF TUNNEL AND RATIONAL DEVELOPMENT

Addressing the longstanding concern of insufficient connectivity in the Chittagong region, a crucial economic hub and Bangladesh's second-largest city, prompted the government to undertake the ambitious Karnaphuli Tunnel project. While existing transportation routes faced challenges like congestion and limited capacity, the decision to construct the tunnel seems to be based on a lack of awareness of better alternatives adopted by neighbouring countries. The claim of the Karnaphuli Tunnel being the first of its kind in South-East Asia appears to be a false assertion driven by national pride, potentially resulting in significant costs to road users and hindrance to rapid economic development.

SEE PAGE 24



An inside view of the Bangabandhu Sheikh Mujibur Rahman Tunnel under the Karnaphuli river in Chattogram.

PHOTO: STAR

Chittagong Hill Tracts. As part of the broader transportation network, it contributes to the world's longest marine drive from Mirershorai to Teknaf and the Asian Highway, connecting Chittagong Port and Matarbari Deep Seaport.

The completion of the Karnaphuli Tunnel is expected to revolutionise transportation dynamics in the Chittagong region, fostering efficient movement of goods and services and, in turn, boosting trade activities. The envisioned enhancement in connectivity is poised to attract investments, stimulate industrial growth, and generate employment opportunities, positioning

drive tourism and subsequently stimulate local economic activities. Beyond its economic impacts, the Karnaphuli Tunnel is expected to catalyse regional development, with improved connectivity often leading to increased investments, job opportunities, and infrastructure development in the surrounding areas. Additionally, there is optimism that the tunnel will play a pivotal role in the establishment of a twin-town on both sides of the river.

However, a critical examination is warranted to assess whether the Karnaphuli Tunnel can effectively realise its stated objectives and deliver

The claim of the Karnaphuli Tunnel being the first of its kind in South-East Asia appears to be a false assertion driven by national pride, potentially resulting in significant costs to road users and hindrance to rapid economic development.