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A modal shift approach to reduce CO2 emissions in the Dhaka-Chattogram freight corridor of Bangladesh

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Outline of the Presentation

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- Problem Statement
- Research Methodology
- Literature Review

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Introduction

Dhaka-Chattogram Expressway(N1) is the main road infrastructure of Bangladesh that is connected to the Principal Seaport Chattogram Port.

It is the prime freight transport corridor of Bangladesh that carries the maximum cargo of the country and also the all-out portion of international merchandised goods.

Unpromisingly, the banking sector is not in a position to change old vehicles and replace them with modern vehicles or electric-charged fleets.

This paper aims to find out the possible approaches to reduce CO2 emissions in the Dhaka-Chattogram freight corridor of Bangladesh and explore whether modal shift is an appropriate approach to create a good environment in the corridor and facilitate modern freight transportation systems in Bangladesh.

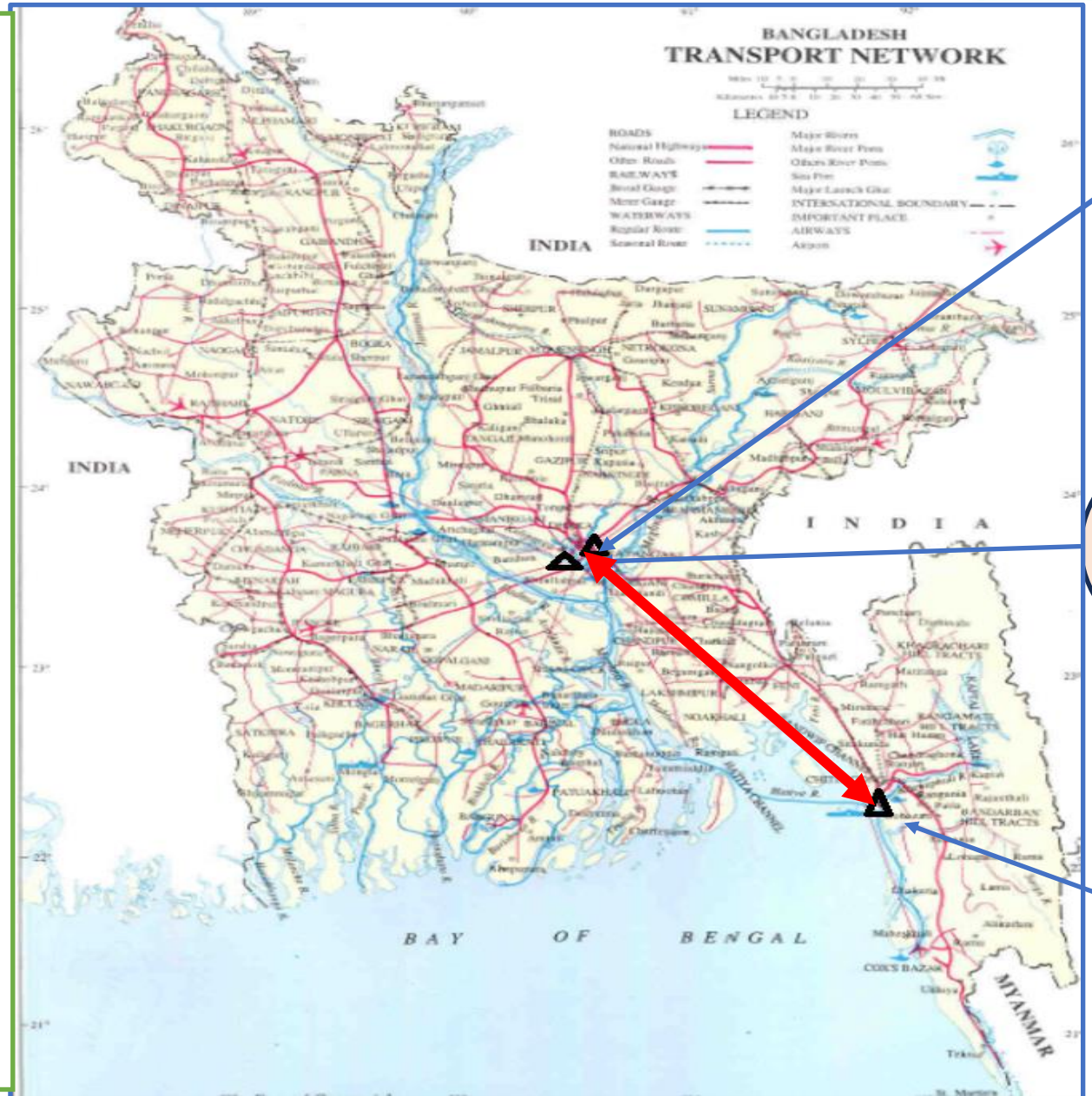
Node –Mode Analysis

Mode

Road. Approx 244 Km long road from the capital city Dhaka.

Rail. Approx 340 Kms long rail track that connected Chattogram port with the capital city Dhaka.

Waterways: Approx 250 kms from Chattogram Port. Little far from the capital.



Dhaka Rail ICD

Pangaon ICT

Chattogram Seaport

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Problem Statement

- Freight movement in road mode is a causal factor to affects the passenger transportation system that occurs in frequent road accidents and congestion.
- Two other modes rail and waterways are available but overutilized and underutilized respectively
- Rail intermodal is not increasing due to the single track between Dhaka and Chattogram.
- Inland waterways play a big role in transporting bulk cargo but it is less than 1% in container intermodal transportation.
- Conventional trucks and covered vans are liable for producing excessive CO2 in km-tonne because of the short size of vehicles and old engines.

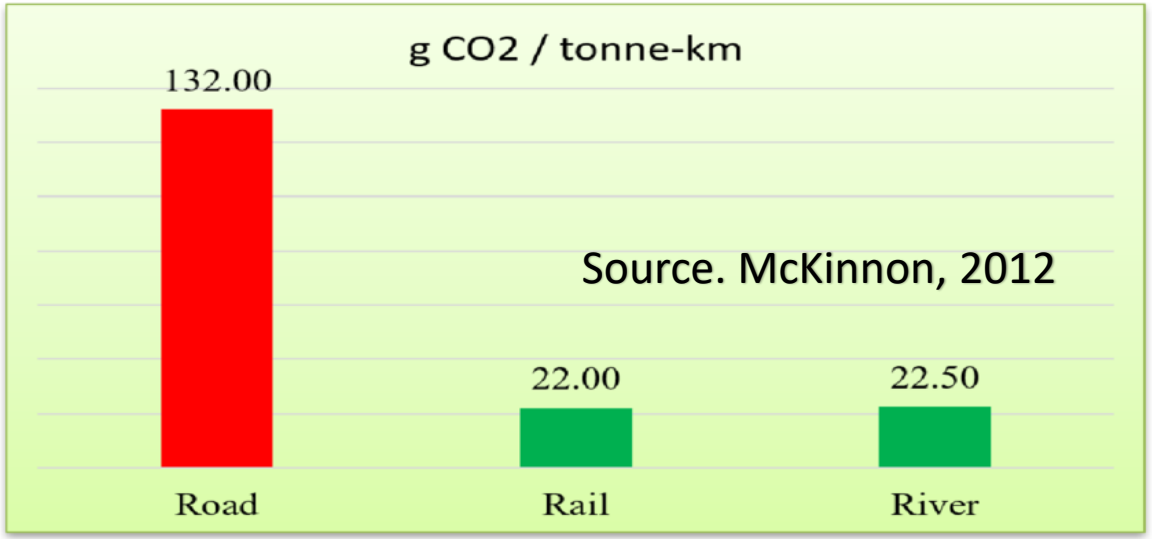
Research Methodology

This research applied a quantitative method to calculate the number of trucks and covered vans are moving in the corridor that tagged to international shipping and their negative impacts on the environment including CO2 emissions.

A benchmark study is conducted with other freight modes rail and waterways to develop a modal shifting plan for the Dhaka-Chattogram freight corridor.

At least half of the tonnage is to be diverted from road mode to rail and waterways in bringing rhythm in this freight corridor.

Operational trucks and covered vans in Bangladesh: 200,000
Operational trucks and covered vans in the Dhaka-Chattogram freight corridor per day : 20,000
Able to save= 10000X(132-22)= 1.1 million gCO2/per day.
(Modal Shift 50%).



Literature Review

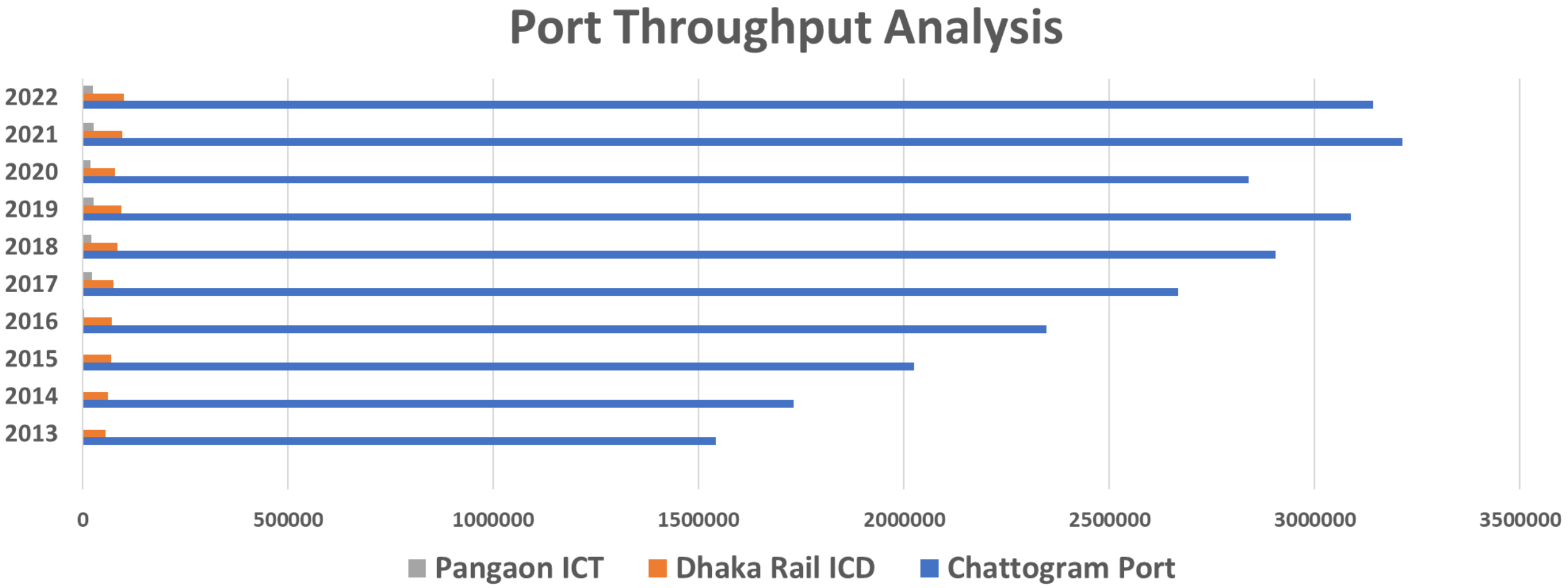
The disintegration(Akter et al., 2019) of seaports, railways, and inland container depots and terminals is putting logistical challenges on the Dhaka-Chattogram corridor.

Nassar et al. (2023) explored that ample time is needed to promote a modal shift to low carbon-intensity modes.

CO2 emissions would decrease if freight traffic shifted from the road to the rail (Hou and Geerlings,2016).

Taneja et al.(2012) brought the “Combi-Road” idea to increase the efficiency of road freight also “Floating Crane” to reduce port congestion by direct transfer of cargo and containers at sea.

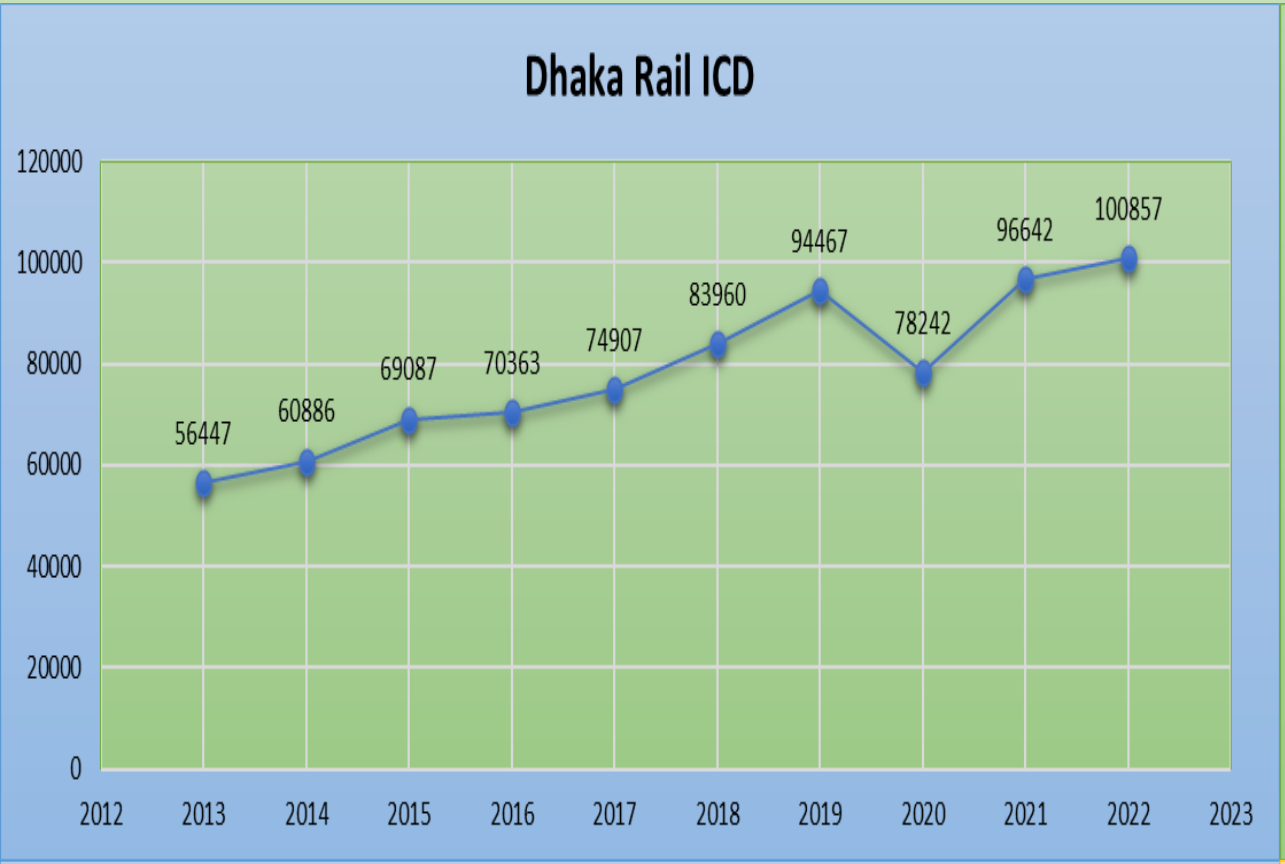
Quantitative Data Analysis

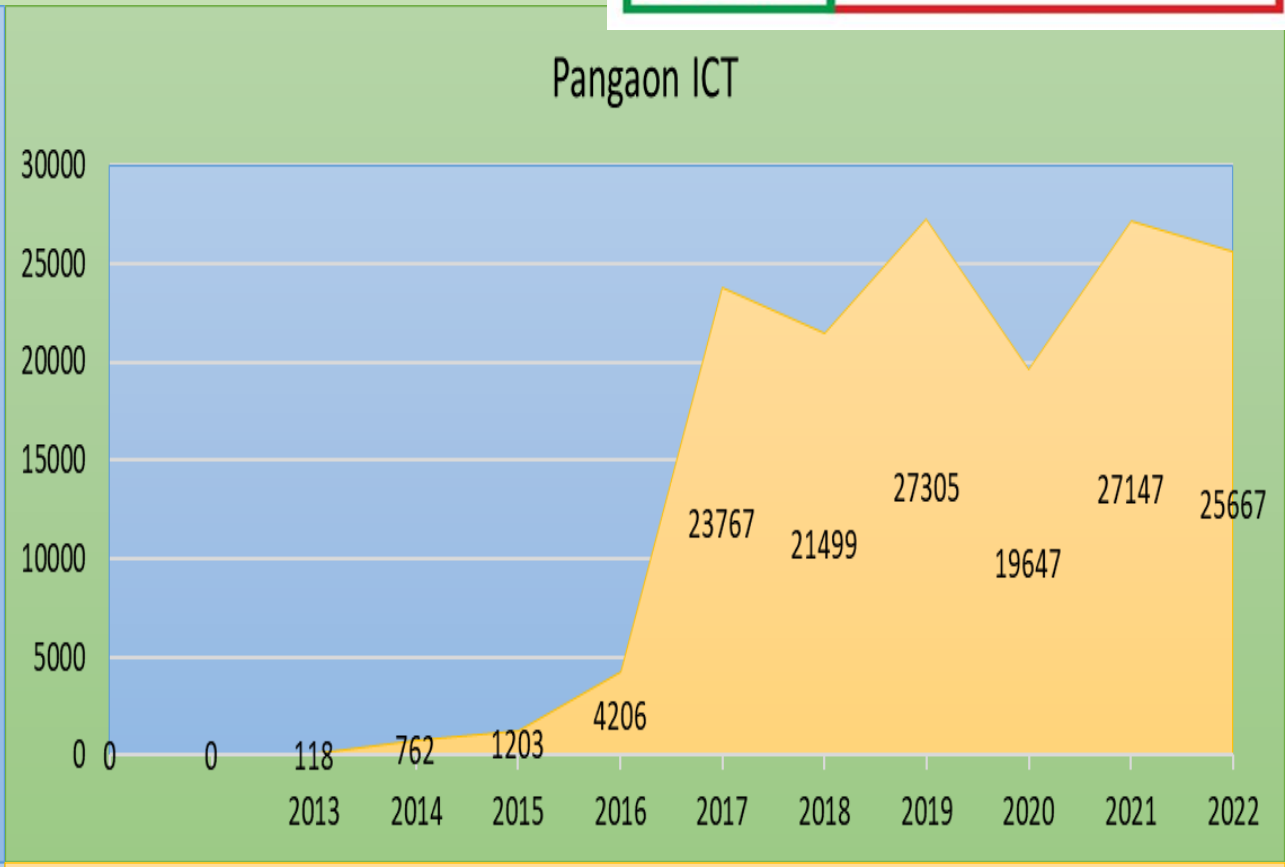


In the last decade (2013-2022),

1. Chattogram Port doubled its port throughput from 1.5 mTEUS to above 3.1 mTEUs.
2. Rail contributed 3.08% and Inland waterways 0.59%.

Quantitative Data Analysis





In the last decade (2013-2022),

1. Dhaka ICD also doubled its port throughput from 50 kTEUS to above 100 kTEUs.
2. Against the capacity of 87 KTEUS, the performance of Dhaka rail ICD is good.

In the last decade (2013-2022),

1. PICT is unable to reach its capacity 116 kTEUs and handling less than its one fourth.
2. Passage delays and backward logistics are reasons behind this low performance.

Major Findings and Discussions

Port Development is essential and the port authority needs to look forward to hinterland and improve inland freight transport connectivity.

Unhealthy covered vans and conventional trucks: no scope for finance in the banking channel.

The new innovation of freight transportation is synchromodality. Chattogram Port has the opportunity to introduce synchromodality to major cities and industrial zones by using rail, road, and waterways.

Rail is in a stagnant position. In 1987, Dhaka rail ICD was established, and no longer to date.

Waterways are not popular due to linking problems, passage delays, backward logistics, and documentation interruptions by customs.

Port throughput increased but the share of intermodal decreased and did not improve due to infrastructural problems and not considering freight as a vital factor for development.

The mindset of users and uncertainty of inland transport resulted in dependence on off-docks of Chattogram and Chattogram port.

Policy problems and coordination among ministries to implement NIMTP.

Way Forward

A dedicated lane for freight vehicles on the Dhaka-Chattogram Highway.

Introduce a special scheme to replace old vehicles and incentives for modern and electric vehicles.

Special green transport for the passion industry and support green factories in Bangladesh.

Reduce the passage time of waterways and establish more ICT by converting main river ports.

Double-decker container trains and east establish more ICD major cities and industrial areas.

Bring Innovation in road transport like combi road, AI-driven traffic systems, green corridors, etc.

Provide government incentives in waterways and develop logistics to reach the last mile.

Implementation of national integrated multimodal Transport policy (NIMTP,2023).

Conclusion

Long-term commitments involving numerous stakeholders include political choices on new infrastructure projects to promote modal shifts.

The practical impact of the research is to develop policies to protect the Dhaka-Chattogram freight transport corridor and make an opportunity to use all modes equally.

It is essential to start synchromodal and intermodal systems by shipper/consignee choices in considering environmental factors in freight transport modes.

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Thanks a lot.