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[기본연구] 방글라데시 도로인프라 현황 및 스마트시티 수요

State of Road Infrastructure in Bangladesh and Demand for Smart Cities

: Case Study of Main Road Redevelopment in Cox's Bazar Town, Bangladesh

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ABSTRACT

Bangladesh faces significant urbanization challenges, evident in its rapid population growth and urban expansion. The country's urban development lacks comprehensive planning, leading to various issues like inadequate infrastructure, traffic congestion, poor drainage, and water supply problems. Cox's Bazar, a renowned tourist destination, grapples with transport issues despite being a critical hub.

To address Cox's Bazar's transportation challenges, a master plan was devised focusing on road network development, drainage, and amenities. The execution involved widening roads, improving drainage, installing utilities, and enhancing safety features. This initiative positively impacted traffic flow, reduced accidents, boosted business, and attracted more tourists. However, challenges persist, such as traffic in other areas, inadequate waste management, beach erosion due to climate change, and a lack of coordinated development efforts.

Expanding road networks, better waste management, integrating transportation systems, creating efficient public transport, and addressing climate change impact on the coast. The region's natural beauty beyond Cox's Bazar could be leveraged with improved access to alleviate pressure on the main city. A comprehensive approach, aligning urban services with transportation planning, is vital for sustainable growth.

방글라데시는 급격한 인구 증가와 도시 팽창으로 인한 심각한 도시화 과제에 직면해 있다. 방글라데시의 도시 개발은 종합적인 계획이 부족하여 부족한 인프라, 교통 정체, 불량한 배수 시설, 그리고 물 공급 문제 등 다양한 문제에 시달리고 있는 상황이다. 특히, 주요 관광지인 콕스바자르 또한 교통 문제에 시달리고 있는데, 이를 해결하기 위해 콕스바자르시는 도로망 개발, 배수, 편의 시설 등에 초점을 맞춘 마스터플랜을 수립하였다. 이 계획의 실행에는 도로 확장, 배수 시설 개선, 유틸리티 설치, 안전 기능 강화 등이 포함되어있다. 이 이니셔티브는 교통 흐름 개선, 사고 감소, 비즈니스 활성화, 관광객 유치에 긍정적인 영향을 미쳤으나 다른 지역의 교통 문제, 부족한 폐기물 관리, 기후 변화로 인한 해안 침식, 그리고 조율된 개발 노력 부족 등의 과제가 여전히 존재한다.

도로망 확장, 더 나은 폐기물 관리, 교통 시스템 통합, 효율적인 대중교통 구축, 그리고 해안 지역의 기후 변화 영향 해결 등이 필요하다. 콕스바자르 이외의 지역에 있는 자연 경관을 활용하여 주도시의 압박을 완화할 수 있을 것이다. 도시 서비스와 교통 계획을 통합하는 종합적인 접근법이 지속 가능한 성장을 위해 필수적이다.

Bangladesh, is the eighth largest populous country in the world and one of the most densely populated countries[1]. It has a population of 169 million in an area of 147,570 square kilometers (57,320 sq mi) and 1119 person live per square kilometer. Bangladesh shares land borders with India to the west, north, and east, and Myanmar to the southeast; to the south it has a coastline along the Bay of Bengal[2]. Bangladesh is at 35th position in world in Gross Domestic Production (GDP) and her GDP is \$460 billion [3].

Economic Growth, Bangladesh has experienced rapid urban population growth in recent decades, where the urban population has grown 8.87 million in 1974,15.54 million in 1981, 20.15 million in 1991, 28.00 million in 2011 and 31.66 million in 2022[2]. According to the world Bank, in 2022 the urban population growth rate of Bangladesh is 3.0% [1].) & where the current national population growth rate is 1.22 [2]. This is expected by the world bank to rise urban population to 60% by 2050[4].

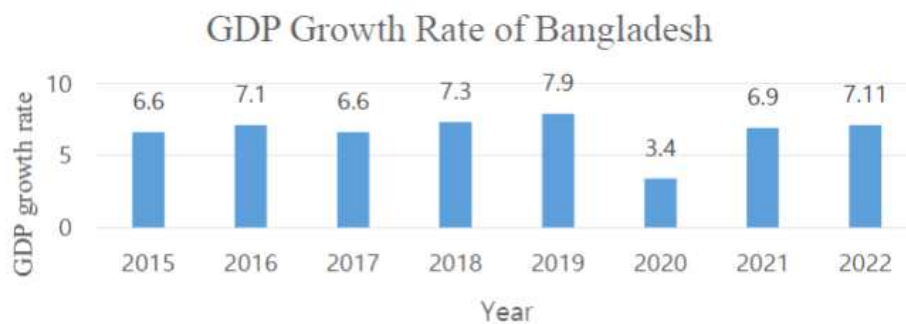


Fig 1: GDP Growth Rate of Bangladesh[2]

Because of more urban population the questions of urbanization are very particular importance there. With such a high rate of population growth land use are changed and urbanization are increasing. In the last 50 years many municipal authority & city corporations are created here.

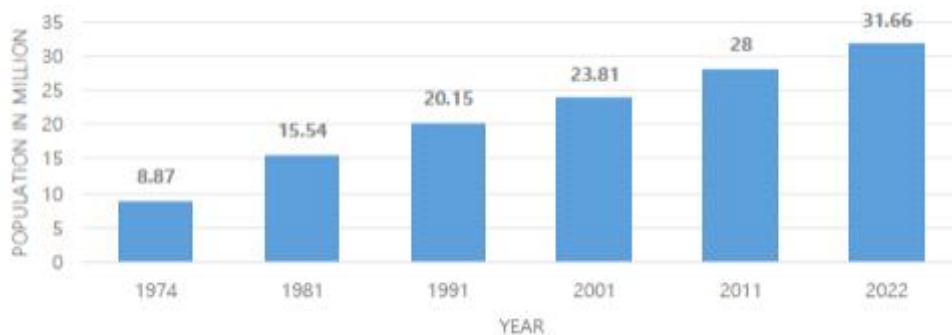


Fig 2: Urban Population growth in Bangladesh[2]



Fig 3: Urban center in Bangladesh[2]

In 1974 Bangladesh has only 79 municipal town and in 2022 the number is 327 which includes 12 city corporation. The Dhaka, and the Chittagong divisions contain over 61.36% of the urban population in the country [2].

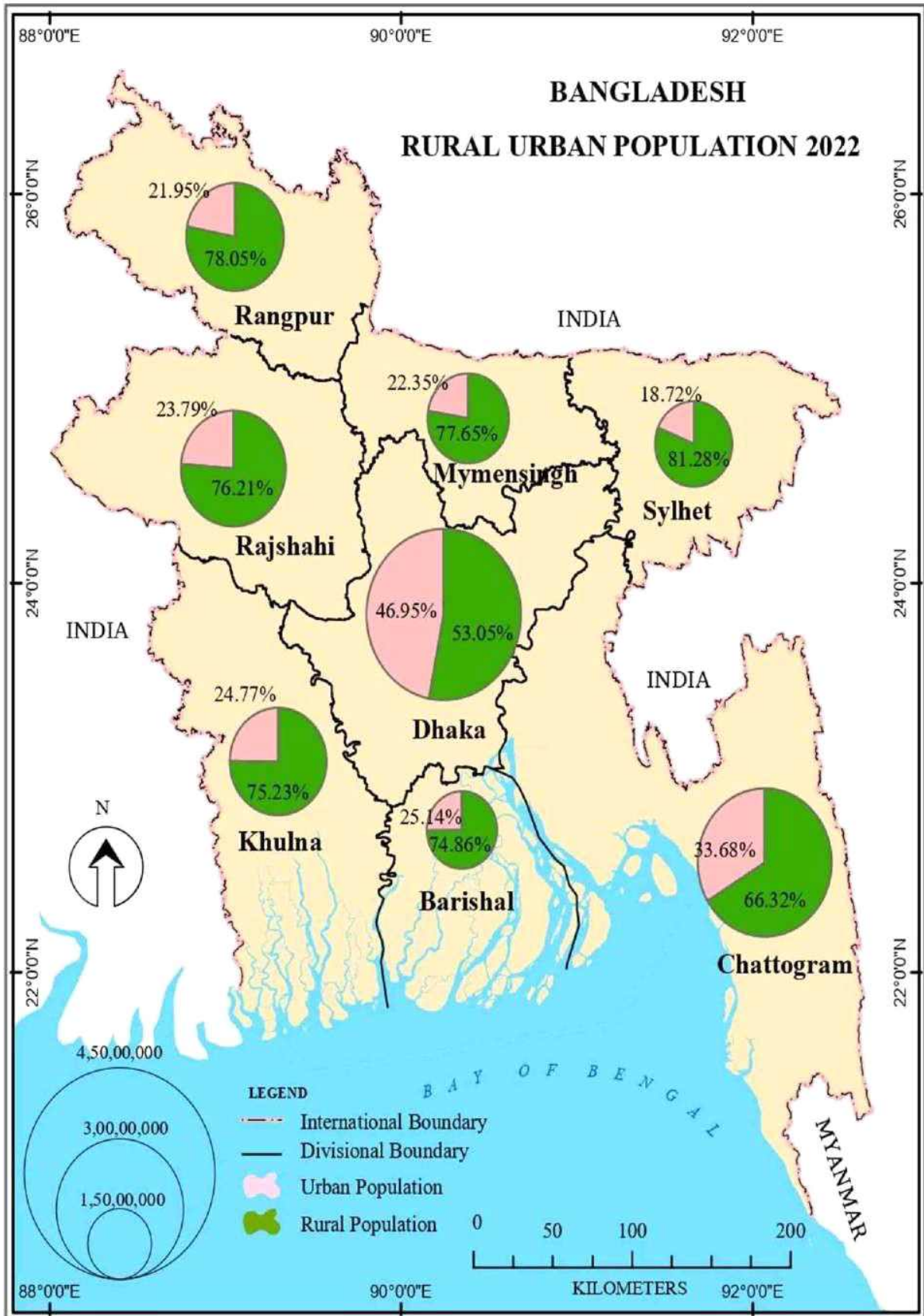
In Bangladesh, Urban Development Directorate (UDD) prepare national Physical Plan. There are also 5 development authority like RAJUK, KDA, CDA, RDA, Cox'sDA and Municipal Town authority also prepare master plan and control the development under its jurisdiction. At present there is no national comprehensive plan of Bangladesh. By 2023 11.08% area have come under master plan and by 2025 it will be 15.52% of total area of Bangladesh. So Urban development is going on without any planning [5].

Table-1: Planned area of Bangladesh:

Organization Name		Area in sq. km.	Percentage
RAJUK Area		1528	1.04
CDA Area		1152	0.78
KDA Area		824.76	0.56
RDA Area		364.79	0.25
Cox'sDA Area		2491	1.69
Sub Total (A)		6360.55	4.31
UDD	Recent Completed Planned Area	9881	6.7
	Ongoing Planning Area of UDD	6465.06	4.38
Subtotal (B)		16346.06	11.08
Grand Total of Planned Bangladesh (A+B)		22706.61	15.52
Total Area of Bangladesh		147570	100

Source: UDD,2022

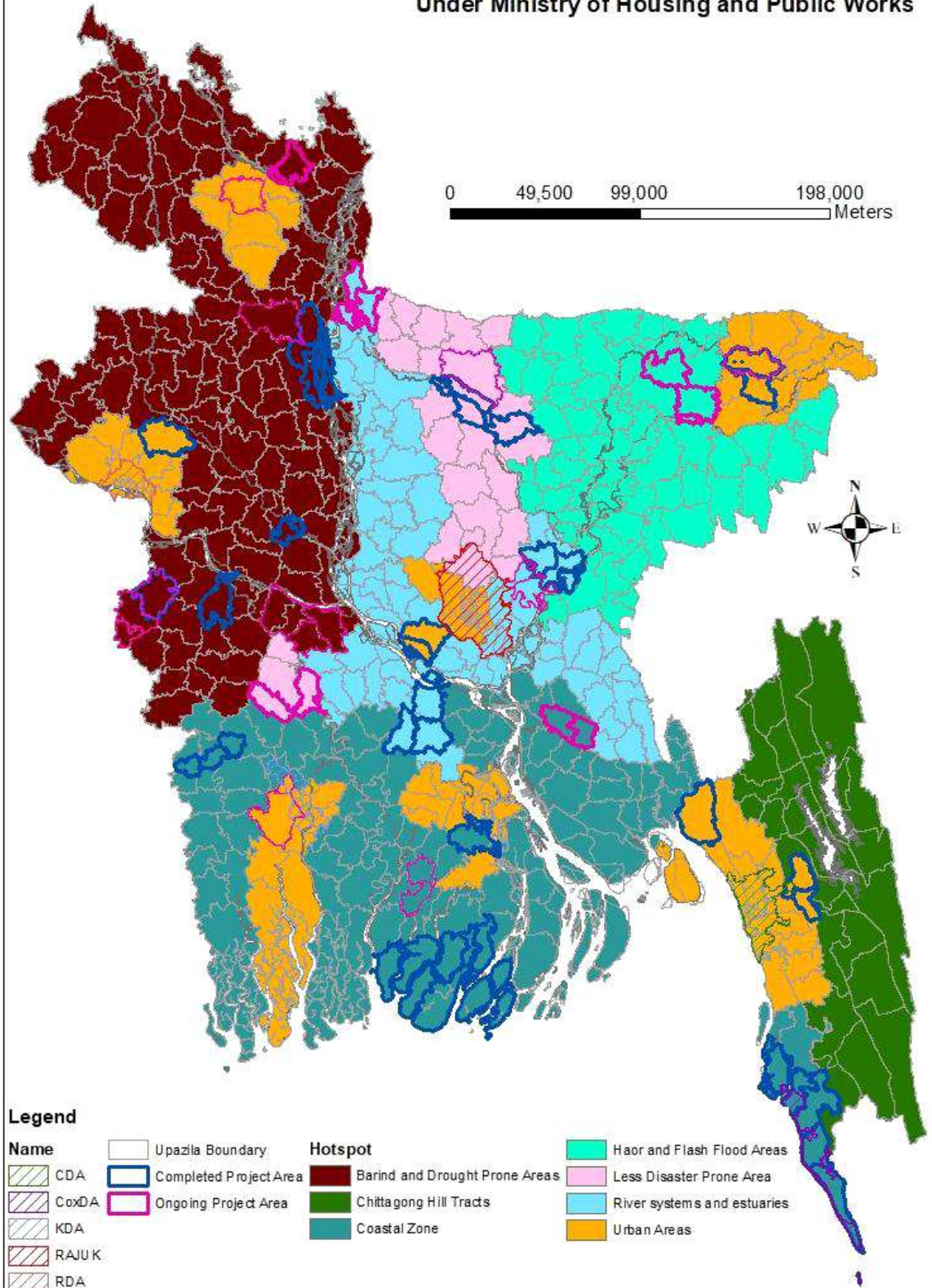
RAJUK-CAPITAL DEVELOPMENT AUTHORITY
 KDA-KHULNA DEVELOPMENT AUTHORITY
 RDA-RAJSHAHI DEVELOPMENT AUTHORITY
 CDA-CHITTAGONG DEVELOPMENT AUTHORITY



[Fig. 4] Urban-Rural Population Rate of Bangladesh[2]

Planned Area of Bangladesh and Delta Plan 2100

Under Ministry of Housing and Public Works



[Fig. 5] Planned area of Bangladesh[5]

Cox's Bazar is a city, fishing port, tourism centre, and district headquarters in Southeastern Bangladesh. The iconic Cox's Bazar Beach, one of the most popular tourist attractions in Bangladesh, is the longest (120 km) uninterrupted beach in the world. It is located 150 km (93 miles) south of the city of Chittagong. The Cox's Bazar district area 2491.86 sq km, & Cox's Bazar city covers an area of 32.90 km² had a population of 28,23,000 (BBS2022). Cox's Bazar is connected by road, rail and air with all over part of the country Best tourist place in Bangladesh.

As one of the most beautiful and famous tourist spots in Bangladesh, the major source of economy in Cox's Bazar is tourism. It is known for its wide sandy beach which is claimed to be the world's longest natural sandy sea beach (120 km) which is the most attractive tourist spot in the country. Miles of golden sands, towering cliffs, surfing waves, rare conch shells, colorful pagodas, Buddhist temples and tribes, delightful seafood- are the attraction of Cox's Bazar. Millions of foreigners and Bangladeshi natives visit this coastal city every year. As a result, a large number of hotels, guest houses and motels have been built in the city and coastal region. The attractive local variety of cigars and handloom products of the Rakhine tribal families are good products for the tourists. Their unique customs and costumes attract visitors from home and abroad. Cox's Bazar tourist resort has a nine Golf course in addition to varied other tourist facilities.



Fig 6: Sea Beach Area of Cox's Bazar

In 2013 urban Development Directorate, Ministry of Housing & Public Works Published a master plan for coxsbazar area named ‘The Development Plan for Cox’s Bazar Town and sea beach up to Teknaf’ contains the vision, goals and objectives, policies and proposals to guide the development of the region under the Plan over the next 20 years 322.81 sq km. Policies and proposals for each of these components are therefore directed towards their composition into and integrated whole, so that they together function efficiently for the city or an area as whole. The duration of this Structure Plan is 20 years; from 2010 to 2030. Periodic review and updates in every five years will be required. This will help understand the nature of development pressure to be accommodated with the implementation period. Mid term review of the Plan can be conducted in 2021. This review will confirm the nature development in the region and the achievement in line with nation’s development vision of 2021. [6]

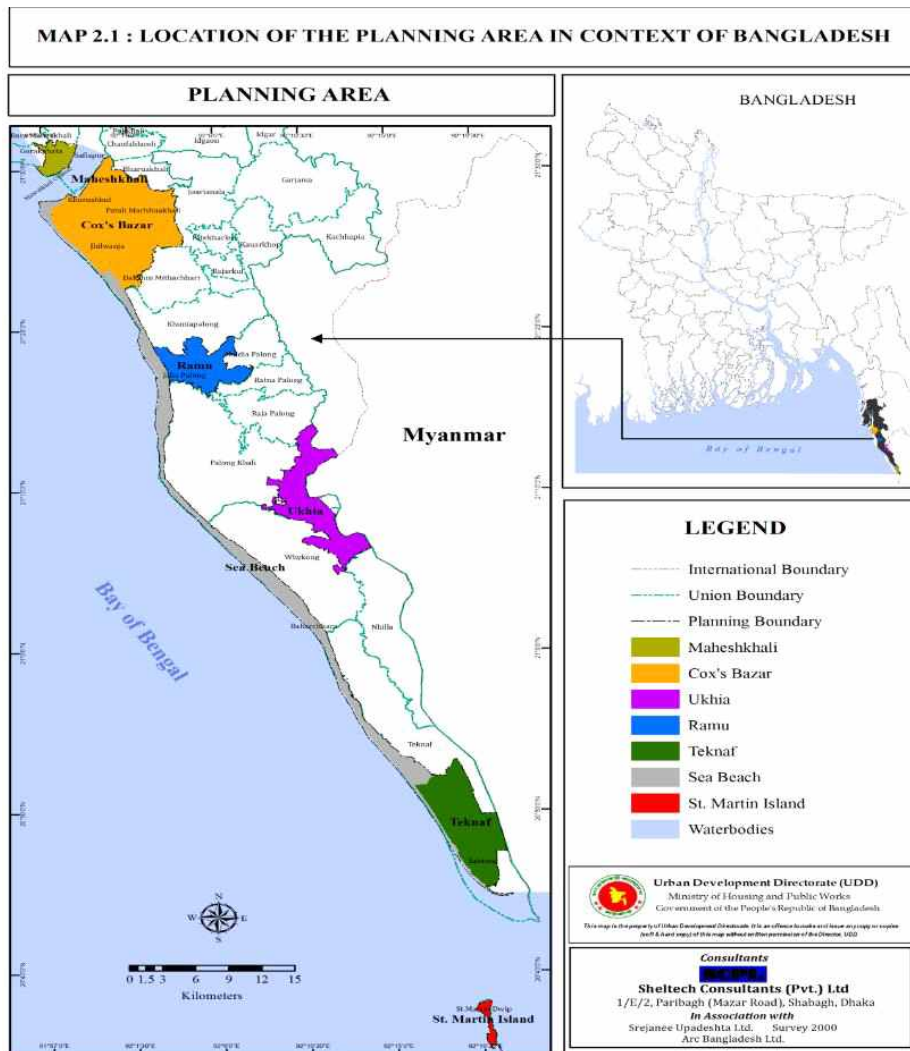
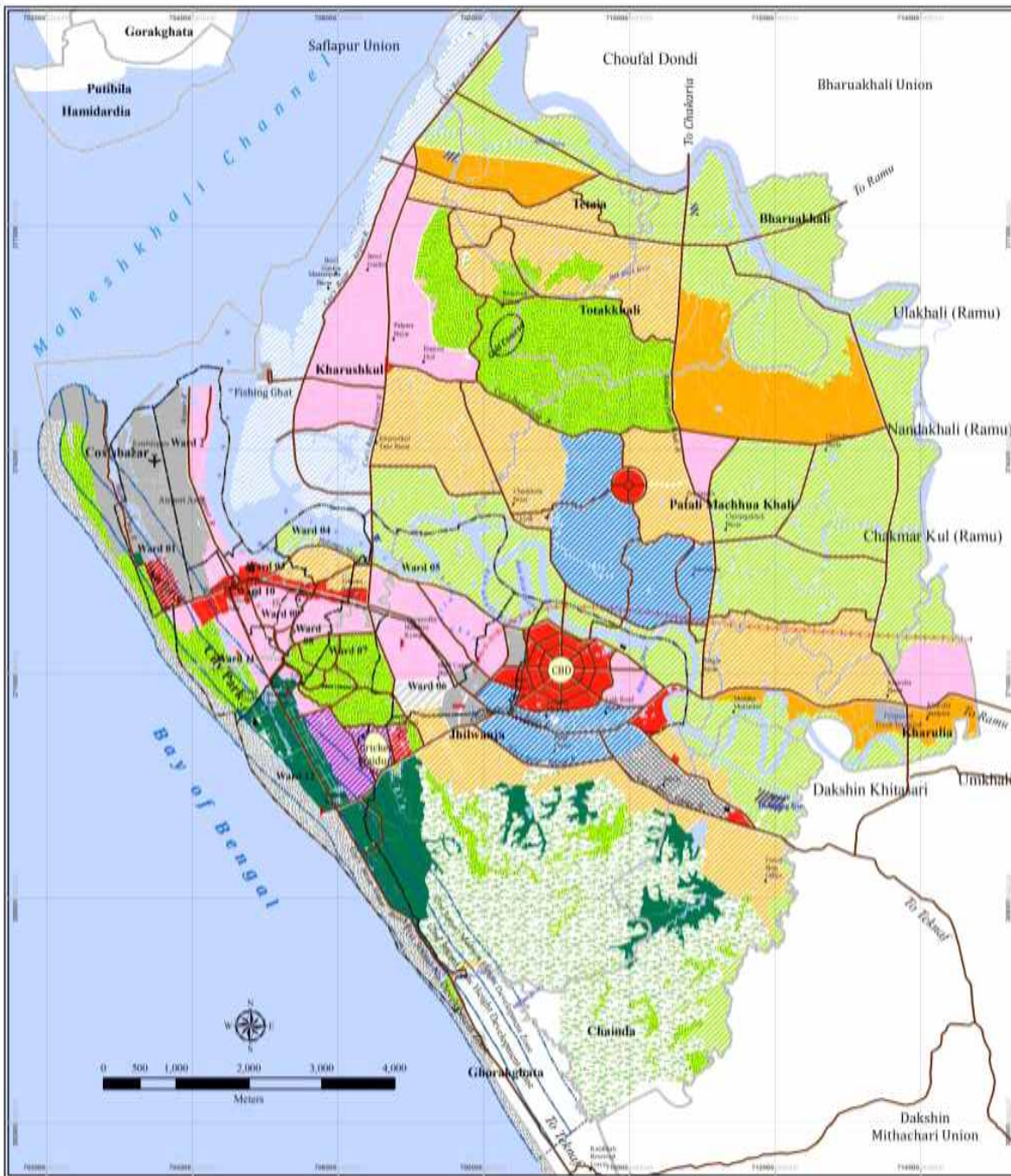


Fig 7: Coxsbazar Master Plan area[6]

MAP 5.2A: STRUCTURE PLAN OF COX'S BAZAR PAURASHAVA AND SURROUNDING AREAS



<p>Map History</p> <p>Date: June, 2011</p> <p>Urban Development Division (UDU) Department of Housing and Urban Planning Government of Bangladesh</p>		<p>LEGEND</p>	
<p>Position and Name</p> <p>Dr. Nurul Islam Nazem Team Leader</p> <p>Fazana Hossainuddin Project Director</p> <p>Abul Hasnat Foad Director, CDD</p>	<p>Signature</p> <p><i>[Signature]</i></p> <p><i>[Signature]</i></p> <p><i>[Signature]</i></p>	<p>Consultant</p> <p>ShelTech Consultants (Pvt.) Ltd. 1/7/1, Durrang (Mazar Road), Dhaka-1000</p> <p>In Association with Srinovoo Consultants Ltd. Survey 2009 d/o Bangladesh Ltd.</p>	<p>Legend Items:</p> <ul style="list-style-type: none"> Traveller spots Airport Bus Ghat Bus Terminal Historic Reservations Hospital Judge Court Parashara Office Police Station Bus Parital Office Municipal Boundary Paurashava Boundary Ward Boundary Development Restriction Zone Rail Line Proposed Road Administrative Agricultural Health Area Commercial Education & Research Fishing Forest & Vignation Conserved Industrial Mixed Use Open Space Residential Restrictive Area Road Setback Zone Open Facilities Business Area Transport & Communication Water Dumping Site Water Water Treatment Area Water Bodies

Fig 8: Coxsbazar Municipality & Sourrounding area master Plan[6]

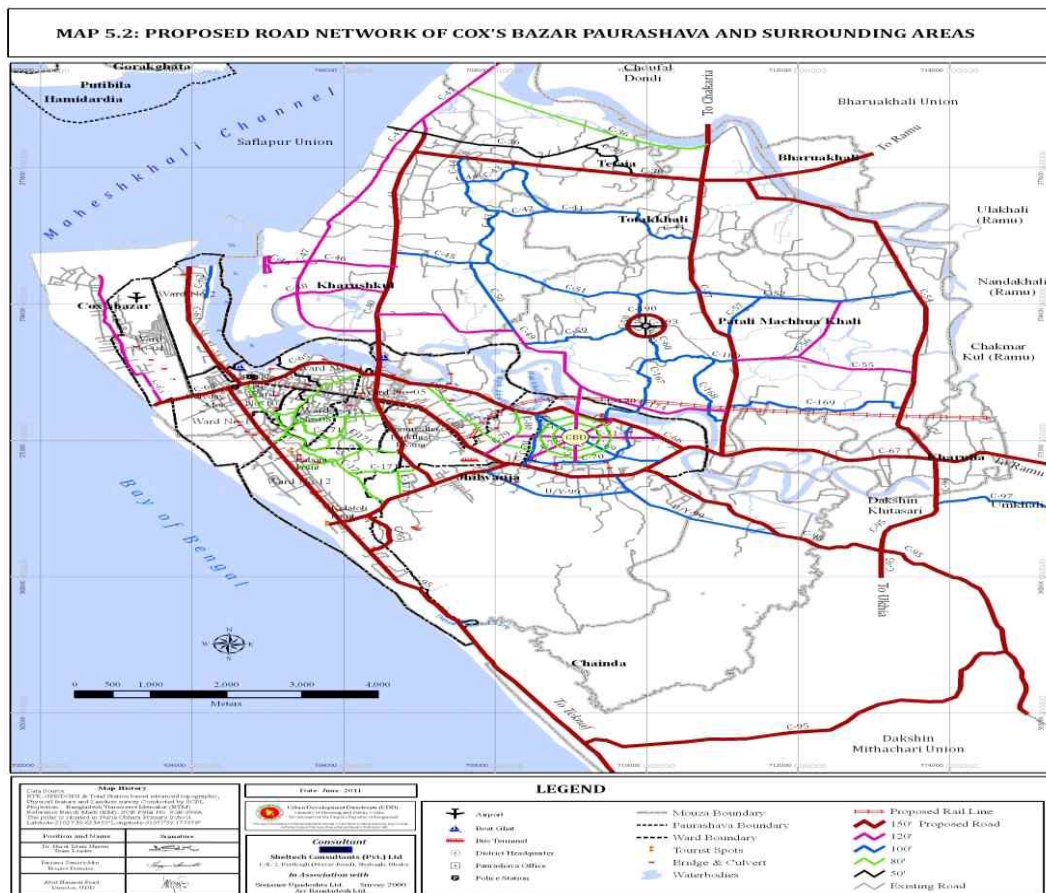
IV

Proposed Road infrastructure in the Cox's Bazar master plan

Cox's Bazar is a District Town and regional town in the north east of the country. The town is connected by road and air with the divisional head quarters Chittagong and National Capital Dhaka. Apart from merely being a District Town, Cox's Bazar is a tourist city, which attracts thousands of people every day who need a convenient mode of transport to reach the destination and come back.

Transportation and communication is a serious problem in the present Planning areas. The present transportation system of the coxsbazar area is dominated by road network catering to the passenger services and freight transport. The road network provides access to various places within the area as well as connects various parts of the country through several bus routes.

The circulation system in terms of roads has been provided in such way so as firstly, to improve the regional connectivity of the planning region, secondly, to improve the connectivity within the study areas of the region and thirdly, to provide approach road connecting all the land uses/activities to make a proper balance between land use and road network. In order to improve the overall connectivity, three types of roads have been proposed namely arterial /primary roads (width 100 to 150 feet), sub-arterial /secondary roads (60-80 feet) and access roads (less than 60 feet)[6].



2.1. Policy Recommendation in master plan:

- Policy- 01: Reduce Traffic Congestions within Cox’s Bazar Town and Surrounding Areas
- Policy-02: Widening of Existing Narrow Roads and Incremental Road Network Development
- Policy-03: Incremental Road Network Development[6]

2.2. Design Principals and Standards in master Plan:

By reviewing different rules and regulations, previous Master Plan standards have been fixed up by the consultants. The standards suggested for different road hierarchy are given below

[Table. 3] Road Standards according to Hierarchy

Road Hierarchy	ROW in meter	
	For Widening	For New Construction
Primary Road	18-24	36-45
Secondary Road	13-16	18-20
Tertiary Road	9-12	12-15
Local Road	6-8	6-8

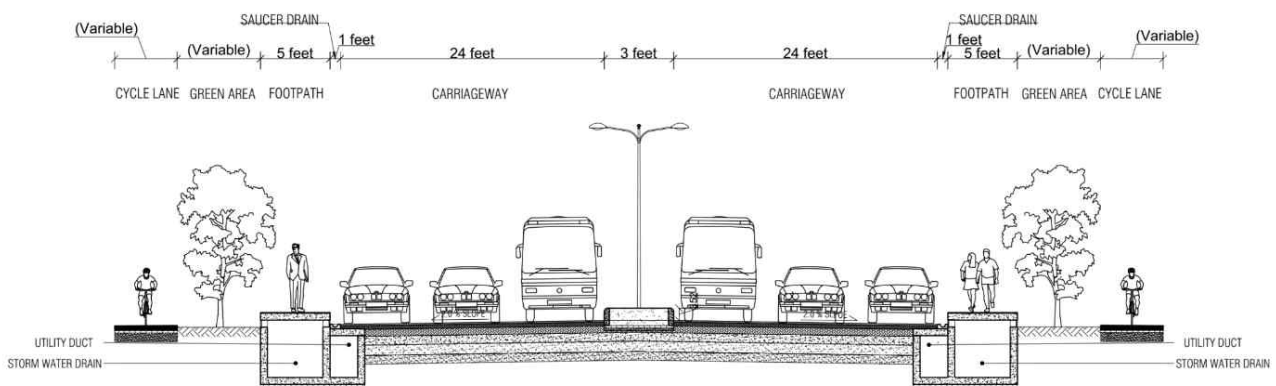


Fig 10: Cross section of Road network[7,8]

2.3. Past Scenary of Road before Redevelopment:

The proposed road is the main arterial road of coxsbazar town. The road was very unusable condition. Drainage capacity besides the road is very narrow. It has low discharging capacity. During rainy season it does pass sufficient storm water. Small types of vehicle can not drive through this road during rainy season. In dry season large of small vehicle and very slow traffic in this road. there is no footpath in this and sufficient road. Business man was losing their business. Tourist & local inhabitants does not come beause of broken road. [7]

2.4. Execution of Master to develop Main Road in Cox's Bazar Town:

Following the master plan Government take a decision develop the main road of coxsbazar town. Under the development of the many utilities facilities will be provided with road such as: main road widening, RCC box culvert, RCC drain, footpath and utility duct, footover bridge construction, LED Display board, water fall, streetlight, cc camera, wifi access point, Public toilet, Teracota, Arboriculture, Bus bay, Public sitting, Removable dustbin, Feature wall, Wall and boundary gate, etc. Cox's Bazar development Authority & Road & Highway Department implemented this redevelopment work [7,8].

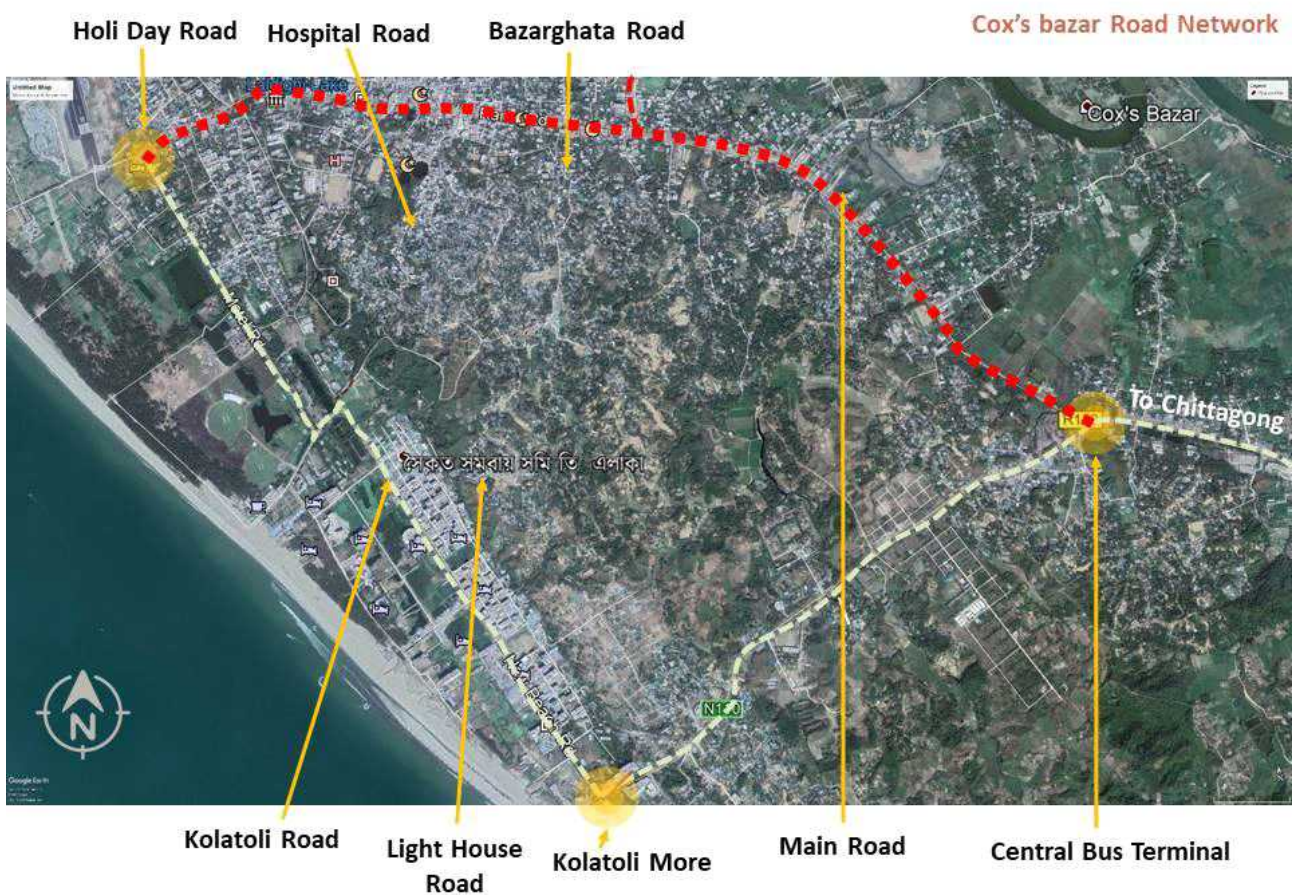


Fig 12: Satellite Image Map of Main Road, Cox's Bazar

2.4. Activities finished under the Road Redevelopment project:

- Main road of the town is widened
- RCC box culvert is established for stormwater drainage
- RCC drain, footpath and utility duct is established
- footover bridge construction at the main intersection of the road
- LED Display board, water fall established at different places of the road
- Streetlight, cc camera, wifi access point at different intervals
- Public toilet facilities at important points

- Teracota for traditional exeibition
- Flower & other tree plantation besedes road and in road divider
- Public sitting besides footpath
- Removable dustbin for waste collection
- Feature wall established to exihbit national tradition
- Wall and boundary gate in different Key point istalleatiuon



Transportation networks are essential to the functioning of societies and economies and provide the infrastructure for the movement of people and goods over space and time. The existence and utilization of transportation networks are fundamental to the modern age and the negative effects of congestion and pollution associated with their increasing usage demand urgent attention. Transport sector is one of the important factors in promoting development. The proposed plan & policies of Cox's Bazar in this respect envisage transport network which will provide safe and uninterrupted access with alternative linkages and connectivity within the study region as well as outside the study region. Encouraging rapid urbanization in the region. Road networks have been designed in such a way that it includes all the areas and enhances the level of urbanization. Revitalization of the airport for rapid communication between Cox's Bazar and other parts of the region be operated. Besides the sea beach, the city of Cox's Bazar is also growing in an unplanned manner. At some places it is highly overcrowded, and in other areas still under utilized. There is hardly any balance between transport network and land uses. Urban services are inadequate for almost all the services.

Apart from these important areas, there are a large number of sites filled with unparalleled natural beauty in the region. Some of these areas are: Ukhiya, Ramu, Whykong etc. If these areas could be developed by giving proper access to sea beach, pressure from Cox's Bazar could be reduced. Implementation of transportation Planning is thus necessary for these regions also.

References:

- [1] <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=BD>
- [2] Bangladesh Population Census. Bangladesh Bureau of Statistics BBS, Dhaka: Ministry of Planning. (2022).
- [3] <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=BD>
- [4] <https://blogs.worldbank.org/sustainablecities/towards-digital-transformation-resilient-urban-development-bangladesh>
- [5] <http://www.udd.gov.bd/site/page/0e3bfa62-e46e-4ac9-99b6-126e9469df8f/>
- [6] The Development Plan for Cox's Bazar Town and sea beach up to Teknaf, Urban Development Directorate, Ministry of Housing & Public Works, Bangladesh(2013)
- [7] www.coxda.gov.bd
- [8] www.rhd.gov.bd