Bangladesh University of Engineering & Technology

Plan 402: Project Planning Studio

Development Project Proposal for Construction of New Railway Corridor from Bhanga to Kuakata Connecting Payra Port.

Level-4 Term-2

Department of Urban & Regional Planning, BUET

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PART-A

PROJECT SUMMARY

1.0 Project Title: Construction of New Railway Corridor from Bhanga to Kuakata Connecting Payra Port.

2.0 Basic Information

2.1	Sponsoring Ministry/Division	Ministry of Railways
2.2	Implementing Agency	Bangladesh Railway
2.3	Concerned Sector/Sub-sector of ADP	Transport and Communications
2.4	Concerned Division of Planning Commission	Physical Infrastructure Division

3.0 Objectives and Targets of the Project

3.1 To establish 214 Km long new broad guage rail way from Bhanga to Kuakata between Padma multipurpose bridge and southern regions of the country.

3.2 To construct 10 major bridges of total 4.86 km length will be over the Kumar, Kaliganga, Kirtankhola, Payra, Andharmanik, and Tiakhali rivers

3.3 To construct 19 stations at identified locations.

4.0 Project Implementation Period	6 Years
4.1 Date of Commencement	February 2024
4.2 Date of Completion	December 2029

5.0 Total Estimated cost of the project: "Not Applicable"

6.0 Mode of Financing: "Not Applicable"

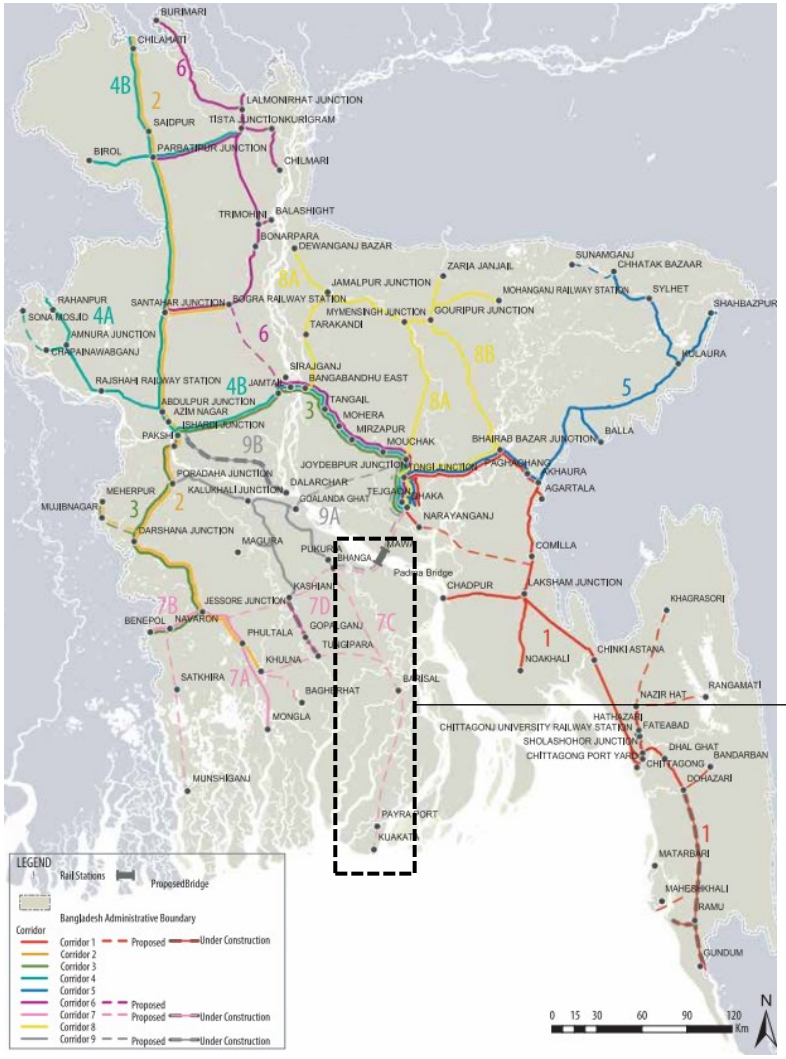
7.0 Location of the project

Division	**District**	**Upazilla**
2	**7**	16
Dhaka	Faridpur	Bhanga
	Gopalganj	Muksudpur
	Madaripur	Rajoir, Madaripur Sadar, Kalkini
Barishal	Barishal	Gournadi, Wazirpur, Babuganj, Barishal Sadar, Bakerganj
	Jhalakathi	Nalchity
	Barguna	Amtali
	Patuakhali	Dumki, Patuakhali Sadar, Kalapara

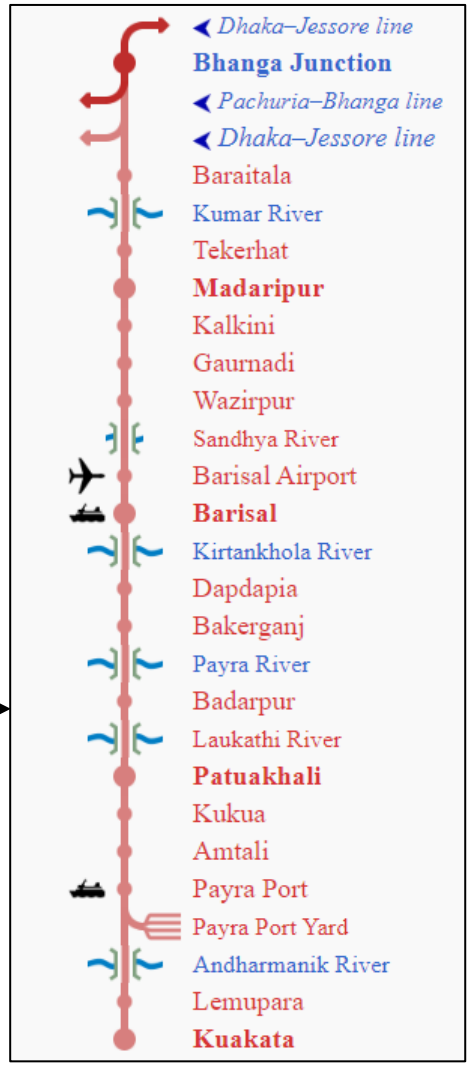
8.0 Location Wise Cost Break-Down: "Not Applicable"

9.0 Component Wise Estimated Cost Summary: "Not Applicable"

Bangladesh Railway Network by Corridor



Bhanga-Payra-Kuakata Railway Project



Station Name	Division	District	Upazilla
1. Bhanga Junction	Dhaka	1. Faridpur	1. Bhanga
2. Boroitola		2. Gopalganj	2. Muksudpur
3. Tekerhat		3. Madaripur	3. Rajoir
4. Madaripur			4. Madaripur Sadar
5. Kalkini			5. Kalkini
6. Gournadi	Barishal	4. Barishal	6. Gournadi
7. Wazirpur			7. Wazirpur
8. Barishal airport			8. Babuganj
9. Barishal city			9. Barishal Sadar
10. Bakerganj			10. Bakerganj
11. Dapdapia		5. Jhalakathi	11. Nalchity
12. Kukua		6. Barguna	12. Amtali
13. Amtali			13. Amtali
14. Badarpur		7. Patuakhali	14. Dumki
15. Patuakhali			15. Patuakhali Sadar
16. Payra Bandar			16. Kalapara
17. Payra Bandar Yard			
18. Lemupara			
19. Kuakata			

Source: Railway Master Plan (2016-2045)

10.0 Project Logical Framework

	Narrative Summary	Performance Indicators/ Targets	Means of Verification	Monitoring Mechanism	Assumption/Risk
Goal	Enhance regional connectivity and stimulate economic growth in south and southwestern regions	▪ Increased Gross Domestic Product per Capita ▪ Accelerated Gross Domestic Product Growth in Southwestern Region of Bangladesh ▪ Increased Employment Opportunity ▪ Improved Socio-Economic Development Indicators (HH Income, Literacy, Reduced Poverty Rate) ▪ Increased Human Development Index (HDI)	▪ Reports of Statistics Institute and relevant Ministries ▪ National Statistics ▪ Bangladesh Railway Report ▪ IMED Report	All outputs subject to monitoring: ▪ Initial, end of Project, and during operation of the project surveys. ▪ Performance indicators for the project ▪ EIRR assessment in benefit monitoring and evaluation report	▪ Timely funding ▪ Coordinated development of transport infrastructure ▪ Timely project implementation
Purpose	To establish railway connectivity between Bhanga and Kuakata facilitating passenger and freight transport at reduced cost	▪ Diversion of passenger and freight traffic presently being carried by IWT and Roads ▪ XX% Passenger Traffic Growth Rate after 2030 ▪ XX% Freight Traffic Growth Rate after 2030 ▪ Change in Transportation Cost ▪ Change in Travel Time	▪ On site verification ▪ Project Completion Report ▪ Audited annual financial statements of Bangladesh Railway ▪ Annual Progress Reports of relevant Institutions	▪ Monthly reporting of key indicators and action taken ▪ Quarterly field surveys	▪ Government commitment to railway reforms ▪ No Occurrence of natural/man-made disasters ▪ Stable political situation
Output	▪ Land Acquisition ▪ Construction of Necessary Embankment ▪ Major Bridges including approach bridge ▪ Minor Bridges including Culverts ▪ Construction of Track ▪ Telecommunications and other facilities	▪ Acquisition of 2692 acres land within June 2025 ▪ Construction of Embankment within December 2025 ▪ Construction of 10 major bridges of total 4.86 km length will be over the Kumar, Kaliganga, Kirtankhola, Payra, Andharmanik, and Tiakhali rivers by 2028 ▪ Completion within budget of 214 km of broad gauge railway line by 2029 ▪ Construction 19 stations in Bhanga Junction, Boroitala, Tekerhat, Madaripur, Kalkini, Gournadi, Wazirpur, Barishal Airport, Barishal City, Dapdapia, Bakerganj, Badarpur, Patuakhali, Kukua, Amtali, Payra Bandar, Payra Bandar Yard, Lemupara, and Kuakata by 2029 ▪ Completion of all works within December 2029	▪ Review of project design ▪ Engineering reports ▪ Tender documents ▪ Monthly project progress reports ▪ Project Completion Report	Monitoring Progress of the Project and Review of Relevant Reports	▪ Timely Arrangement of adequate funding ▪ Timely procurement of civil works and goods through international competitive bidding
Activities	1.1 Arrangements for counterpart funds for project implementation	▪ XX crore amount of fund from donor agency	▪ Completion by Bangladesh Railway		Funds received from donor agencies time to time.
	1.2 Technical design and final survey	▪ Completion of technical design and final survey with in XX days or months	▪ Design and survey reports		Completed in a timely manner
	1.3 Advance action for procurement		Completion by Bangladesh Railway		

	Narrative Summary	Performance Indicators/ Targets	Means of Verification	Monitoring Mechanism	Assumption/Risk
	2.1 Socioeconomic survey for land acquisition and resettlement	Completed by Bangladesh Railway in consultation with deputy commissioners	Signing of contracts between Bangladesh Railway and deputy commissioners		Timely completion of survey
	2.2 Preparation of a land acquisition plan, including site verification of land and buildings	Land acquisition to be completed 1 month in advance of the need for land for construction in the section	▪ Land Acquisition and Resettlement Plan ▪ Monthly Progress Report		Preparation of Land Acquisition and Resettlement Plan within budget in due time
	2.3 Land acquisition and Resettlement	▪ Acquisition of 2692 acres land within June 2025 ▪ To be implemented by Bangladesh Railway in line with the Resettlement Plan	▪ Completion by Bangladesh Railway within June 2025 ▪ Monthly project progress reports ▪ Evaluation by Bangladesh Railway 1 year after the completion of resettlement	Monitoring of resettlement by Bangladesh Railway and construction supervision consultants	Legally acquire the land according to Acquisition and Requisition of Immovable Property Act, 2017.
Activities	3.1 Procurement of contractors	Preparing bidding document and Invitation to bid for prequalification	Approval of contracts by Bangladesh railway	Evaluation of prequalification bids	
	3.2 Construction of civil works and facilities	Supervision by consultants	Monthly progress reports		No political unrest and no occurrence of natural disaster. Completion of construction works in due time
	4. Implementation of environmental protection and mitigation measures and environmental monitoring	As outlined in the EIA and the EMP	▪ Monthly progress reports	Monitoring of EMP actions	Project manager implement the protection and mitigation measures.
	5.0 Training of Bangladesh Railway staff	Execution of training program, seminars, and workshops	▪ Training Reports	Training assessment	Adequate manpower to conduct the training session

PART-B

PROJECT DETAILS

14.0 Background

14.1 Background with problem statement

Enhancing connectivity and stimulating economic growth in southern Bangladesh is the goal of the transformative Bhanga-Payra Railway Project. This project intends to optimize the potential advantages of the Padma Bridge and connect the southern region into the developing railway network by constructing a broad gauge rail line from Bhanga in Faridpur to the significant Payra seaport in Patuakhali via Barishal.

Functional and integrated connectivity is critical to Payra Port's efficiency. In order to enable seamless conveyance of products, a freight corridor must be constructed alongside the rail link. Especially captive cargo is anticipated to be operated by Payra Port, which is ideally situated on the Bay of Bengal. Therefore, rail, road, and river links are necessary for its viability.

Barishal division is identified as one of the lagging regions in the five-year plans. According to the Asian Development Bank, in Barisal infrastructure is still inadequate in many areas as they are either damaged by natural disasters or otherwise no longer functioning effectively. Barishal division has insufficient road connectivity, inadequate healthcare facilities, limited resources, lack of employment opportunities and challenges in access to clean water and sanitation. This division has no railway connectivity with other regions. The Barisal division will have remarkable railway connection when the Bhanga-Payra Rail link is operational. Barisal, which was previously unconnected by rail, would be connected to capital and other important parts of Bangladesh.

The 30-year revised Railway Master Plan (2016-2045) of the Bangladesh Railway outlines large-scale goals, including connecting Dhaka with key destinations such as Cox’s Bazar, Mongla Port, Tungipara, Barishal, and the Chattogram Hill Tracts. The project aligns with the government’s vision of balanced regional development. The government’s commitment to building a railway line from Bhanga (Faridpur) to Payra Port via Barishal and Patuakhali underscores its dedication to enhancing regional connectivity.

14.2 Linkages (to other projects, institutions)

The project will establish a complete new corridor which is Dhaka-Mawa-Jajira-Bhanga-Barisal-Kuakata. The new corridor is justifiable to construct after completion of Padma Bridge Rail Link project (Dhaka-Mawa-Bhanga).

Under this project, 10 major bridges will be constructed to complete the railway network. Bangladesh Bridge Authority (BBA) is identified as the responsible institution to complete the construction of bridges.

14.3 Objective

1. To establish 214 Km long new broad guage rail way from Bhanga to Kuakata facilitating connected between Padma multipurpose bridge and southern regions of the country.

2. To construct 10 major bridges of total 4.86 km length will be over the Kumar, Kaliganga, Kirtankhola, Payra, Andharmanik, and Tiakhali rivers

3. To construct 19 stations at identified locations.

14.4 Outcome

There is enormous economic potential for the Bhanga-Payra Railway Project. By improving connectivity, it will promote efficient freight transit between the harbor and hinterland, increase the region's economy overall and promote trade, industrial growth, and opportunities for employment. The project is expected to shift the major share of passenger and freight that are now being carried by road and inland waterways. Besides, an ample amount of traffic will generate from Faridpur, Barisal and Khulna region.

14.5 Outputs

1. Acquisition of 2692 acres land in the project location for constructing railway network.
2. Construction of necessary embankment before the construction of bridges.
3. Construction of 10 major bridges of total 4.86 km length will be over the Kumar, Kaliganga, Kirtankhola, Payra, Andharmanik, and Tiakhali rivers
4. Construction of 214 km of broad gauge railway line from Bhanga to Kuakata
5. Construction 19 stations in Bhanga Junction, Boroitala, Tekerhat, Madaripur, Kalkini, Gournadi, Wazirpur, Barishal Airport, Barishal City, Dapdapia, Bakerganj, Badarpur, Patuakhali, Kukua, Amtali, Payra Bandar, Payra Bandar Yard, Lemupara, and Kuakata.

6. Provision of telecommunications and other facilities at the railway stations to facilitate rail communication.

14.6 Activities

1. Arrangement for necessary amount of fund for project implementation from donor agencies.
2. Preparation of technical design for the project after conducting field surveys.
3. Bangladesh Railway will perform the necessary procurements.
4. Preparation of land acquisition and resettlement plan after completing the socio economic survey.
5. Acquire 2692 acres land in the project location and resettlement of those affected.
6. Preparation of environmental management plan (EMP).
7. Construction of civil works and facilities such as broad gauge railway tracks, embankments, bridges, stations, and other facilities by the consulting firm.
8. Arrangement of training sessions for railway staffs by Bangladesh Railway.

14.7 Target Population

Upazilla	Target Population	Male	Female
Bhanga	293835	139763	154072
Muksudpur	307513	146362	161151
Rajoir	245301	117966	127335
Madaripur Sadar	396749	186713	210036
Kalkini	218326	102114	116212
Gournadi	205876	99224	106652
Wazirpur	254503	124107	130396
Babuganj	154546	73454	81092
Barishal Sadar	237207	117895	119312
Bakerganj	356012	173054	182958
Nalchity	186882	89022	97860
Amtali	214436	104845	109591
Amtali	214436	104845	109591

Dumki	81837	39364	42473
Patuakhali Sadar	354800	173564	181236
Kalapara	286988	145151	141837
Kalapara	286988	145151	141837
Kalapara	286988	145151	141837
Kalapara	286988	145151	141837

15.0 Whether any pre-appraisal/feasibility study/pre-investment study was done before formulation of this project? If so, attach summary of findings & recommendations. If not mention the causes.

For the construction of a Broad Gauge (BG) railway link between Bhanga and Payra Port, a Feasibility Study (Environmental & Social Impact Analysis and Resettlement Plan) were carried out. The objectives of the feasibility study include establishing the project's economic and financial feasibility and determining the best alignment, as well as providing construction and supervision services and detailed design for rail lines, bridges, stations, yards, and other infrastructure. The study was carried out in the two stages. The engineering design, the preparation of tender documents, and a thorough feasibility assessment and safeguard aspects will comprise the first two phases.

FS Phase	Study Type	Study Component
Phase I	Detailed Feasibility Study and Safeguard Policy Study	• Detailed Feasibility Study with Economic and Financial Analysis • Environmental Studies • Social and Resettlement Studies
Phase II	Detailed Engineering Design	• Detailed Survey of the proposed route • Detailed Engineering Design of all infrastructures including embankment, track, bridges & culverts, station buildings, platforms, approach road, foot over bridges, platform sheds yards, signaling, etc. • Detailed Cost Estimates

16.0 Financial Analysis

Cost Item	'With' the project case (Project Cost)
Capital Cost	Construction cost (including cost of land) of improvement/ upgrading/ strengthening etc. of the road.
Environmental Cost	Cost towards mitigation of adverse environment effect as result of construction activities.
Social Cost	Cost towards land acquisition, social rehabilitation of the displaced/ effected population, structure etc.

Type of Cost	Cost (Lacs Taka)
Double-Track Rail line Construction Cost	887802
Social Cost (Land acquisition, compensation and resettlements)	3500000
Environmental Cost	736

17.0 Lesson Learnt from Similar Nature of Project(s)

One of the similar types of this project is Construction of Khulna-Mongla Port Rail Line. Construction of Khulna-Mongla Port Rail Line.

Feasibility study is must required for this type of project and it should include environmental report, social and resettlement report. This Khulna-Mongla Port Rail Line Project has completed topographic, hydrological, morphological, geotechnical, material, traffic, environmental, social and resettlement survey. The study of traffic flows along the rail corridor is required for projecting the major possible traffic offerings at the corridor. Every project has negative and positive impact on surrounding places. Both aspect of impact on quality of life has to be determined for the feasibility study of the project and the influence area of the project should be determined.

The design standard should be maintained as per the specifications of Bangladesh Railway. The standard specifications for the project items are tracks, bridges, stations, yards, crossings, geometrics, loadings, design life, navigational clearing requirements.

For assessing the rail route certain criteria should be considered and they are regional connectivity, topography, land formation, traffic study, commercial aspects, existing infrastructure, future development plan, initial social assessment, initial environmental assessment, technical solutions etc.

The project had multiple challenges in managing the project's schedule and expense, which grew far above the original projections. Numerous issues contributed to the project's delay, including the Covid-19 pandemic, the railway's altered route, and the building of a bridge across the Rupsa River. The budget and timeframe for the project also needed to be extended and revised several times. Therefore, risk assessment is very crucial for any project which helps to manage the unforeseen challenges.

18.0 Indicate the basis of item-wise cost estimate and date: "Not Applicable"

19.0 Give comparative cost of major items of similar other projects: "Not Applicable"

20.0 Attach detailed annual phasing of cost (As per Annex-V): "Not Applicable"

21.0 Specification/design of major components (attach): "Not Applicable"

22.0 Attach Amortization schedule for projects having involvement of loan from Government (As per Annex -VI): "Not Applicable"

23. Description of effect/impact and specific mitigation measures

23.1 Other Projects/Existing Installations

The construction of rail line from Bhanga to Kuakata is proposed to initiate after the completion of Padma Bridge Rail Line project Project (Dhaka-Mawa-Bhanga- Jashore) according to the railway master plan (2016-20245). The Padma Bridge Rail Line project is already behind schedule, which may delay the initation of the Bhanga to Kuakata Rail Line project. The Bhanga-Mawa and Bhanga-Jessore railway construction projects are ongoing. Timely implementation of the ongoing projects have a vital effect on the undertaken Bhanga to Kuakata railway project. Besides, the project will have a crucial impact of the development of Payra sea port. There is not any negative impact of this project on other existing or future projects.

Coordination with ongoing projects and minimizing disruptions during construction is crucial. Regular communication and collaboration with relevant authorities and stakeholders can help address potential conflicts and ensure smooth project execution.

23.2 Environmental Sustainability

Soil: During piling for construction of bridges, disturbance of riverbed, the suspension of fine sediments and the re-deposition of coarse factions will be affecting the turbidity and degradation of fish habitat. River erosion and siltation may occur due to bridge construction.

There is need to decrease period over which the piling operation is to take place, to avoid the daily re-suspension of sediments. Preventative maintenance of equipment to mitigate negative environmental impacts such as leakages and spillages. To provide adequate river training works according to design against the riverbank erosion and siltation at the bridge location. Maintenance works also to be required after completion.

Water: All controlled waters that is all surface waters and ground water (aquifers), are included in this evaluation. Particularly of note is whether local water bodies are ecologically important or used as a source of drinking water. Along the proposed alignment there are some perennial and seasonal wetlands of which some are natural and some man-made. These wetlands are the source of several wetland products while some are used for shrimp production on which the locals are dependent for their livelihood. Other than, this water is used for irrigation and other domestic use. Water and wetlands being of importance to the local ecosystem, economy and culture a thorough assessment is required.

During the construction phase, contamination of ground and surface water may occur due to disposal of organic and inorganic materials.

Water quality will be monitored at identified locations during construction for all parameters, which will be carried out during the EIA stage.

Air: Dust and emissions during construction may impact air quality. Air pollution may occur from improper material storage, management and usage during construction.

In order to prevent inadmissible pollution of the soil and air with waste by keeping concrete aggregates (rod, metal, sand) in special storages at the construction site. Air quality monitoring during construction to monitor PM2.5, PM10, SO2, NOx and CO for summer and winter season.

Noise Pollution during Operations: Trains produce a tremendous amount of noise and vibration, often reaching dangerously high decibel ranges. This can be stressful and irritating not only to human beings living near railways, but also to local wildlife.

Noise barrier will be constructed along the track and plantation on embankment may help reduce the impact of noise pollution.

Biodiversity and Ecosystem Services: The construction of rail line may intersect natural habitats, affecting flora and fauna in the project area. The proposed railway track does not pass through any protected sites such as sites of Special Scientific Interest or Ecologically Critical Area or Forest Protected Area or Wildlife Sanctuary or Fish Sanctuary or a wetland of national or international importance. But still, a detailed baseline study is required to ascertain the present status of the wildlife/fauna and flora of the project area which can serve as a yardstick in the future for monitoring any changes or impacts in the future. However some of the habitats may be critical for some species and may have local, national and global importance. Fishing is the most thriving sector in Barisal because of the entwining rivers, canals and the Bay of Bengal at the southern coasts. Construction of bridges over the Kumar, Kaliganga, Kirtankhola, Payra, Andharmanik, and Tiakhali rivers may disrupt the aquatic ecosystem. There is risk of surface and ground water contamination during the construction period which hamper the fish and shrimp production.

Bangladesh Railway will facilitate thorough environmental impact assessments (EIA) to identify sensitive areas, implement buffer zones, and adopt eco-friendly construction practices. All impacts mitigate measures and monitoring requirements will be defined in an Environmental Management Plan. Mitigation measures are comprised of three components, pre-construction construction and operations. Most of the preconstruction and operating period measures will be implemented by BR, while the construction period measures will be the contractor's responsibility, and enforced by the Engineer and overseen by BR. The construction period section of the EMP has been integrated into the construction contract as a set of environmental clauses and costed as a separate Bill of Quantities section, allowing for easy calculation of financial penalties.

Reduce Emission of Green House Gas: The positive environmental effect produced by trains is the amount of carbon dioxide they emit. The carbon footprint left by a train compared to automobile is very insignificant. A train full of passengers, for example, leaves a significantly smaller carbon footprint per capita than a car with just one person. The proposed project is

likely to induce modal shift of freight transport from roads to railway, leading to low greenhouse gas emission.

23.3 Climate Change Adaptation and Mitigation

Considering the disastrous effects of natural hazards and the potential aggravating effects of climate change, and that the proposed project lies in the coastal area it is essential that a detailed study covering natural hazards and related risk as well as the anticipated rise in the frequency and intensity of climatological hazards associated with climate change be conducted. Moreover mainstreaming climate change issues in all developmental activities complies with the Bangladesh Climate Change Strategy & Action Plan (MOEF 2009).

Coastal districts are inundated due to monsoon flood. Further rise in sea-level will expand inundation areas where Patuakhali, Khulna and Barisal regions would be the most affected. Climate variability allowances should be considered for the sudden rise in the water levels in the river and volume of water for which proper river training may be necessary. In this regard flood pattern and threat to the railway alignment with normal flood return period, 5-year period, 20-years, and 50-years need to be forecasted. Additionally erosion prone areas along the river banks, water logged areas need to be identified for enforcement of river banks/ training or cross-drainage structures.

23.4 Gender, Women, Children, and Persons with Disabilities

The project follows the theme of inclusive development and include female in the development works. Inclusion of women in project implementation and construction pahses in those upazilas and districts could change their financial situation as the income from the project may help them to open small scale business such as poultry farms, shrimp farms, shops, embroideries.

The design measures of the project will ensure equitable access of persons with disabilities can have to the rail line.

Gender-sensitive assessments will be conducted to provide accessible facilities, and promote inclusivity. Address specific needs of women, children, and persons with disabilities.

23.5 Employment: Railway projects have the potential to create employment in various stages of their development, construction, and operation. This project can generate employment in different phases of project implementation.

1. Construction Phase:

Infrastructure Construction: Building railways involves significant construction work such as laying tracks, building bridges, and stations. This requires a large workforce including urban planners, engineers, construction workers, architects, and laborers.

Jobs: Construction projects require materials like steel, concrete, and machinery, which creates demand in related industries. This boosts employment in manufacturing and transportation sectors.

Support Services: During construction, various support services such as security, catering, accommodation, and transportation for workers are also needed, generating additional employment opportunities.

2. Operation and Maintenance Phase:

Station Staff: Railway stations require staff for ticketing, customer service, security, and maintenance, creating jobs for station masters, ticket inspectors, cleaners, and security personnel.

Train Operations: Operating trains requires drivers, conductors, and other personnel involved in train maintenance and inspection.

Maintenance Crews: Railway tracks, signals, and other infrastructure components need regular maintenance to ensure safety and efficiency. This involves employing maintenance crews, technicians, and engineers.

Administrative and Management Roles: Railway projects also require administrative staff for functions such as scheduling, logistics, finance, and human resources.

3. Indirect Employment:

Tourism and Local Businesses: Improved accessibility via railways can attract tourists and encourage the development of tourism-related businesses such as hotels, tour guides, and souvenir shops, leading to job creation in these sectors.

Industrial Development: Railway projects can stimulate industrial development along their routes, attracting investment and creating employment in industries such as manufacturing, agriculture, and mining.

Skills Development and Training: Railway projects often provide opportunities for skills development and training programs, especially in regions where technical expertise may be

lacking. This can enhance the employability of local residents and contribute to long-term economic development.

23.6 Poverty Situation:

Majority of the population live below the poverty line in that region. People of those seven districts and sixteen upazilas migrate to capital cities and live in a miserable condition. The impact of flood and river bank erosion is also severe in those areas. Nearly one-fifth of people from Barishal division have come to Dhaka division to improve their living quality. But this increasing number of internal migrants to Dhaka is pushing up the population density in the capital city. Because of poor mitigation systems people of those areas suffer must. Integrating a new project for the betterment of the connectivity of that region will create employment opportunities and may uplift the economic situation of the people. New railway tracks not only ensure connectivity but also reduce the transportation costs which eventually benefit the mass people. Railways facilitate the movement of goods, which can boost trade and commerce. This can benefit individuals engaged in small-scale agriculture or local businesses by providing access to larger markets for their products. Kuakata, a potential tourist spot will be immensely benefitted because of tourist will be having efficient and affordable transportation systems after the completion of the project.

23.7 Organizational Arrangement

The state-owned rail transport agency Bangladesh Railway will implement the project. The project is foreign aided project and will need external financial assistance from foreign donor agencies. China Railway Design Corporation has expressed its interest in constructing and financing the railway line. The Chinese company will jointly arrange finance for the network and also conduct engineering, procurement, and construction along with its partner, China Harbour Engineering Company Limited. Bangladesh Bridge Authority (BBA) will complete the construction of major bridges in the project area. The Payra Port Authority is responsible for operations, maintenance and development of the port, which is located in Patuakhali, Bangladesh.

23.8 Institutional Productivity:

Bangladesh Railway has undertaken several projects in different phases to connect three ports of Bangladesh with railways. Currently, Bangladesh Railway is implementing a project to link Mongla with Khulna. After the completion of Bhanga-Payra-Kuakata rail line project the three

ports and the capital would come under a strong railway network and create a huge opportunity for Bangladesh Railway to increase its freight transportation many folds, which is a step that could help the state-run transport agency reduce the gap in its income and operation costs.

23.9 Regional Disparity

Spatial disparity of development exists among various regions in Bangladesh. The south western regions including Barisal receive lower budget allocation of ADP. Barisal division has the lowest growth in terms of economy. Barisal division is not connected with railway network. Barisal has a very low contribution of GDP in Transportation, Storage and Communication that makes it difficult to improve its export orientation. The monthly household income of Barisal division is below the national average. The construction of Bhanga-Kuakata rail line will enhance regional development and connectivity of southwestern districts. Once implemented, Barishal and Patuakhali will directly come under the rail network. Barisal would be connected with Dhaka, Khulna, Rajshahi and other important areas of Bangladesh by railway. The Bhanga to Payra Port Railway Construction Project holds immense potential for regional connectivity and economic growth.

23.10 Environmental Clearance

There are several environmental impacts of the project. Environmental clearance under the **ECA 1995 (revised 2010)** needs to be acquired before initiation of the project. Compliance with environmental regulations is essential.

23.11 Other Impacts

The project involves land acquisition and development. It may affect local ecosystems, agricultural land, and habitation pattern. This covers a range of factors, namely the potential effects on or loss of good quality agricultural soil, due to lying of the railway tracks across the rural areas dominated by cultivable land. Permanent loss of land and crop production may distress local people. Acquisition of residential land may disrupt the socio and cultural aspect of the society as people have to leave their roots or ancestors' place. After the completion of the project, land value may increase in the project areas. An assessment need to be done on the loss of cultivable land and food production (particularly rice) and its impact on food security that the government is presently promoting. Land acquisition notice should be served to the owner well ahead of time. Provision of adequate compensation to people need to be ensured. Local NGOs should be engaged for implementation of Resettlement Action Plan (RAP).

24.0 Specific Linkages with Five Year Plan/ SDGs/Ministry/Sector Policies and Priorities

Plan/ Policy	Key issues/Targets/Objectives	Project's alignment with the plans/policies	Challenges after project completion
8th Five Year Plan	▪ Establishment of railway connectivity to every district of Bangladesh. ▪ Construction of 798 km new rail line. ▪ Modernize signaling systems of 222 stations to ensure safety. ▪ 2nd Highest amount of ADP allocations for transport sector. ▪ Bridge division has mentioned high priority transformational project for the 8FYP which includes Barishal-Bhola bridge. ▪ It is expected that Payra port will be fully operational by 2023.	▪ Regional connectivity will be established through a new rail connection among 7 districts. ▪ Construction of 214 km new rail line. ▪ Construction of 19 railway stations between Bhanga to Kuakta. ▪ Utilization of ADP resources. ▪ Construction of 10 bridges of total 4.86 km length will be over the Kumar, Kaliganga, Kirtankhola, Payra, Andharmanik, and Tiakhali rivers.	▪ Two scenarios may arrive. 1. Expected growth of passengers and freight may not be fulfilled. 2. Capacity constraints to handle the future growth of passenger and freight transport. . ▪ Technological obsolescence due to continuous technological development
Perspective Plan: Vision 2021	▪ Increase market share in freight transport ▪ Connect the capital city with the areas where rail network does not exist.	▪ Freight transportation will be easier to the port eventually resulting with greater efficiency of Payra port. ▪ Regional connectivity will be established among 16 upazillas, 7 districts because of establishing the rail	

		line and 19 rail stations.	
Railway Master Plan 2016- 2045	▪ Construction of broad-gauge rail line from Bhanga Junction (Faridpur) to Payra port via Barisal	▪ The project establishes the rail way track between Bhanga to Kuakata.	
National Land Transport Policy, 2004	▪ Enhance the operational capacity of railways. ▪ Obtaining the greater share of freight market. ▪ Fostering inter regional rail links	▪ The objectives of the National Land Transport Policy, 2004 will be achieved by establishing the double track rail line accommodating both freight and passenger traffic.	
SDG (Goal 9)	▪ Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.	▪ A new Railway line will be a resilient and sustainable infrastructure to support the well being of those selected regions	▪ Focus may shift from affordability or equitable accessibility to successfully run the project and recover the cost of the project.
Payra-Kuakata Comprehensive Plan Focusing on Eco Tourism Structure Plan: 2021-2041	▪ Objectives: 1. Improve connection of communities, and improve access to infrastructure, services and facilities. 2. Optimize the existing and future physical footprint of transport services (rail, road, air, waterways)	▪ Extension of railway network in Payra-Kuakata Region	▪

25.1 Mission/Vision of the Implementing Agency/Sponsoring Ministry

Vision of Bangladesh Railway: To provide safe, reliable, cost effective and time efficient rail transport service in the country through modernizing, expanding & maintaining rail system in a manner, which supports government strategies for economic, social & environmental development.

Mission

1. Develop & maintain railway tracks & station infrastructures throughout the country.

2. Maintain & upgrade locomotives, coaches & other rolling stocks.

3. Maintain & modernize signaling & interlocking system & Telecom system of Bangladesh Railway.

4. Ensure safe, speedy & efficient train operation.

5. Implement Government transport policy in rail sector.

6. Procure modern technology related rolling stocks, Track materials & signaling systems suitable for Bangladesh Railway.

7. Manage land asset of Bangladesh Railway.

8. Ensure optimum utilization of Development Budget & Revenue Budget of Bangladesh Railway.

25.2 How does the project contribute in achieving the mission/vision of the Implementing Agency/Sponsoring Ministry

Bangladesh Railway intends to include the southern areas of the country into the expanding railway network by establishing Bhanga-Payra rail link through this project. Balanced development throughout the nation depends on its integration. In addition to the Padma Bridge, the Bhanga-Payra Rail Link improves connectivity between the southern areas and the capital city. It makes use of the benefits of upgraded trade routes and infrastructure.

The project is in line with Bangladesh Railway's mission of improving nationwide connectivity. It establishes connections between unserved regions, promoting social and economic advancement. The idea of a modernized railway network is aided by the rail link. It will make transportation of commodities more efficient, shortens journey times, and improves passenger mobility. When the railway network is completed, it is expected to facilitate the area

realize its enormous economic potential. The Payra Port, a major marine gateway, is connected to the rest of the nation by the rail link. It facilitates export-import trade and expedites the transportation of commodities.

26.0 Whether private sector/local govt. or NGO's participation was considered? If yes, describe how will they be involved? : "Not Applicable"

27.0 In case of foreign aided project mention the major conditionality: "Not Applicable"

28.0 Does the project involve compensation, rehabilitation/ resettlement? If so, indicate the magnitude and cost: "Not Applicable"

29.0 Risk Analysis and Mitigation Measures (identify risks during implementation & operation such as disaster and hazardous aspects etc and suggested mitigation/ safety measures thereof)

29.1 Risks associated with hazards and disasters in the project areas

1. Direct Risks Associated with Natural Disaster	**Measures**
Increased Cyclone Frequency: The project area susceptible to cyclones. More intense cyclones will lead to higher storm surges that can damage rail tracks and their embankments in coastal areas.	1. Strengthen embankments and protective structures. 2. Use geotextiles and rock revetments to protect against erosion to reinforce embankments. 3. Develop cyclone shelters near railway lines. 4. Enhance communication systems for timely alerts
Saline Intrusion and Soil Erosion: Rising sea levels lead to saltwater intrusion into soil, affecting track stability. Coastal groundwater salinity can corrode rail components.	1. Use salt-resistant materials for construction. 2. Use of corrosion-resistant materials or protective coatings for rail structures. 3. Plantation along railway alignment to stabilize soil. 4. Regularly monitor soil conditions.
Extreme Temperature: Increasing temperatures can cause rail expansion and contraction, affecting alignment and safety.	1. Use of heat-resistant materials for tracks. 2. Implement thermal stress monitoring. 3. Optimize maintenance schedules

Floods and Storm Surge: Heavy rainfall and storm surge can lead to flooding, affecting tracks and embankments. Flooding during construction can cause delay in project implementation.	1. Sea level rise projections during rail infrastructure planning. 2. Improve drainage systems. 3. Elevate tracks in flood-prone areas. 4. Plantation along railway alignment to prevent flood. 5. Regularly inspect and maintain culverts and bridges
2. Indirect Risks Associated with Natural Disaster	**Measures**
Disaster induced migration may lead to scarcity of local labors for construction works.	1. Inclusion of disaster preparedness plan aligned with the project. 2. Establish safe shelters for displaced populations. 3. Provide vocational training to local people. 4. Provision of Additional Fund to provide support to workers during disasters.
Delay in project implementation and cost overruns during disasters.	1. Develop strategies to resume operations swiftly after a disaster. 2. Allocate reserves for unforeseen challenges. 3. Consider associated climate risks during financial planning.
3. Risks Associated with Manmade Hazards	**Measures**
Worksite Accidents and Injuries Construction sites involve heavy machinery, elevated structures. Poor safety procedures may lead to occurrence of accidents. Accidents like falls, equipment malfunctions, or collisions can lead to injuries or fatalities.	1. Safety protocols should be maintained for labor safety. Maintaining strict adherence to safety guidelines. 2. Training: Proper training for workers. 3. Regular Inspections: Ensure compliance with safety standards. 4. The existing acts for the welfare of labor should be enforced. For example • The Workmen's compensation act, 1923 • The Employees Compensation act, 1923 • The Trade Unions Act, 1926

	• The Payment of Wages Act, 1936 • The Employers Liability Act, 1938

29.2 Financial Risks

1. Delayed Payment on Contracts:

Project cash flow may be strained by late payments from stakeholders or clients, which might have an impact on timely project execution and operations.

Measure:

i. Clear Terms of Payment: Ensure contracts have clear payment conditions within due time.

ii. Monitoring and Invoicing: Continually track the status of payments and issue invoices. Contractual charges for late payments in the terms of the agreement.

iii. Cash Flow Estimating: Continue to make precise estimates of future cash flows.

2. Unmanageable Cash Flows Risk:

Project execution may be slowed by inadequate liquidity, which may lead to delay in project completion and cost overruns.

Measure:

i. Cash Flow Management: Carefully track inflows and outflows.

ii. Reserve Money: Keeping contingency funds for unforeseen expenses.

iii. Financial Planning: Preparation of robust financial plan

3. Inflation Risk: Project budgets may be impacted by inflation-related cost increases.

Measure:

i. Incorporate provisions within contractual agreements that mandate price adjustments in accordance with inflation indices.

ii. Implement hedging strategies to protect against fluctuations in commodity and currency prices.

iii. Establish a cost contingency fund to provide financial protection against unforeseen cost escalations.

4. Financial Failure of Contractors:

The potential for financial instability or contractor insolvency poses a significant threat to the uninterrupted progress of a project.

Measure:

i. Conduct financial due diligence on contractors prior to granting contracts to ensure a sound financial standing.

ii. Incorporate provisions for the replacement of contractors.

5. Cost Overruns in Construction:

Budgetary overruns caused by unanticipated expenditures that occur during construction. Any alterations in the tax policies can affect project costs and its financial viability.

Measures:

i. Comprehensive cost estimation in the process of project planning.

ii. Establish a contingency fund to provide financial coverage for unforeseen expenditures.

iii. Regular Monitoring: Monitor costs throughout the project lifecycle.

6. Interest Rate Changes (Credit and Interest Rate Risks):

Fluctuations in interest rates may influence borrowing costs and debt servicing.

Measures:

i. Choosing appropriate loan structures.

ii. Interest rate hedging by use of derivatives to manage interest rate risk.

iii. Debt refinancing if rates become favorable.

29.3 Design Risks

1. Defective Design: A flawed or incorrect design can lead to safety hazards, operational inefficiencies, and costly modifications during construction.

2. Design Changes: Frequent design alterations disrupt project schedules, increase costs, and may lead to conflicts

Measure: As the predominant period needed for the execution of railway project is design and survey phase, Proper design is must essential in railway projects, as millions of kg of cargo is likely to transport on that particular route. As a result, the railway department allocates a greater amount of time to the compilation of design and survey reports. The consulting firm, who will prepare the design and survey reports of this project have to complete whole reports which

includes GADs (General arrangements of sheet), hydrology of every major and minor bridge, railway curves, track details with varying chain age.

Risks can be mitigated by assuring excellent design report and approved by company and consultant before the project commences. In addition, additionally by employing expertise surveyors and designers or giving appropriate training to the junior employee under the supervision of experts such a risk can be mitigated. Furthermore, by providing Defect accountability clause in agreement can mitigate the negligence of the constructing firm.

29.4 Technical Risks

Constructing rails comprises a number of complex technical and engineering difficulties. Geological risks including sinkholes or landslides, unanticipated ground conditions, and equipment or material malfunctions are examples of risks. Delays, cost overruns, and safety concerns may result from overlooking these risks.

Measure: To identify potential risks and develop suitable engineering solutions, carrying out in-depth site surveys and geological assessments is very important. Experienced engineering and construction companies with a track record of successful railway projects should be employed in the construction phase.

29.5 Material Risks

Risk associated with construction materials is one of the major risk identified for not only the railway projects but also other construction projects. Purchased construction materials and equipment may not conform to the specification. Timely availability of material is another critical issue.

Measure: Bangladesh railway department must be aware of the purchasing of the materials, the contractors of the material need to be approved by ISO certification. In addition, quality certificate for each materials should be provided. Ballast, sleepers, rails etc. these are majorly used in laying of railway line. The department should have multiple options of dealers of the materials. Because if one dealer is unable to deliver the required material on time, other could deliver that particular item on site on time, to avoid risk associated with delay.

29.5 Legal Risks

Disputes concerning the ownership of intellectual property, compliance with environmental regulations, land acquisition, and contracts may cause project delays and expensive litigation.

Measure: Contracts should be explicit and thorough with all stakeholders. For the avoidance of legal repercussions, adherence to existing laws and regulations is important. Adhere to equitable and transparent procedures for land acquisition should be ensured. Numerous governmental organizations, and other entities that are impacted in some way by the construction of this railroad line have to provide their consent for the project, which will need a difficult and prolonged procedure throughout the construction phase. So, the government should propose a singular window clearance for a project of this magnitude.

29.6 Political and Regulatory Risks

Bureaucratic obstacles, political unrest, and regulatory modifications have the potential to cause substantial delays or even disrupt the project. Moreover, environmental regulations and public opposition may further complicate the approval procedure.

Measure: Establish early negotiations with local communities, regulatory agencies, and government officials during the project planning stage in order to assuage concerns and obtain the required approvals. Adapt strategies in response to political developments and regulatory modifications that may have an effect on the undertaking.

29.7 Operational Risks:

Railroads are subject to operational hazards, including equipment failure, mishaps, and maintenance problems, once they are constructed. Safety risks, reduced service accessibility, and reputational harm can result from poor maintenance.

Measure: Conducting planned inspections along with preventive maintenance is necessary to swiftly identify and resolve problems. Additionally, workers will be provided with emergency protocols and safety training.

29. 8 Market Risks:

The success of railway projects is contingent upon the level of demand for transportation services. The feasibility and financial performance of the project may be impacted by modifications to the economy, adjustments to the demand for freight or passengers, and competition from alternative forms of transportation.

Measure: Market trends and developments will be monitored continuously and service provision will be modified accordingly.

29.9 External Risks

1. Emergence of New Stakeholders and Their Requests for Changes: When additional stakeholders engage with the project, they may make requests for changes or suggest new ones. These modifications may affect the project's budget, schedule, and scope.

Stakeholder management measures: Identifying and interacting with the relevant stakeholders, explaining the goals and advantages of the project, responding to their queries and expectations, as well as maintaining their opinions and level of satisfaction.

2. Public Objections: Public objections may be raised for a number of reasons, including disturbances to nearby neighborhoods, noise pollution, or environmental concerns. Project development may be hampered by these objections.

Measures: Responding to public complaints and questions, educating and informing the public about the project, conducting public outreach and consultation and managing social media presence and media relations.

29. 10 Management and Related Issues

1. Ineffective communication between the people involved can result in miscommunication, disputes, delays, mistakes, and additional work. Establishing trust among individuals, exchanging information, resolving conflicts, and organizing activities all depend on effective communication.

2. Poor project planning can lead to a lack of clarity in the scope, unattainable goals, and poor risk assessment. Determining the project's goals, scope, budget, timeline, quality, and risk management techniques requires careful preparation.

3. Modifications to management practices: The project team and other stakeholders may become confused, resistant, or inconsistent as a result. Modifications to management practices may encompass adjustments to leadership, structure, guidelines, protocols, or techniques. These adjustments must be properly explained, logically supported, and skillfully executed.

4. Resource management is the process of allocating, using, and optimizing the technical, financial, material, and human resources needed for the project. Shortages, wastes, disputes, employee turnover, and inefficiencies are some of the problems that resource management may encounter. Proficiency in resource management is essential to guarantee project performance in terms of quality, cost, and timeliness.