ACCELERATING TRANSPORT AND TRADE CONNECTIVITY IN EASTERN SOUTH ASIA (ACCESS)

PHASE 2 - BHUTAN PROJECT

TERMS OF REFERENCE

FOR

MULTIMODAL TRANSPORT AND TRADE LOGISTICS ASSESSMENT, FORMULATION OF MASTERPLAN(S) AND SUPPORTING CAPACITY DEVELOPMENT

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1. Introduction to Assessment Scope & Objectives

1.1. The Ministry of Infrastructure and Transport (MoIT), the Employer, intends to recruit an appropriately qualified firm (hereinafter referred to as 'the Consultant') to render consulting services for the Multimodal Transport and Trade Logistics Assessment, preparation of related masterplans and supporting institutional capacity development. The services will be procured following the latest World Bank's Procurement Regulations for IPF Borrowers, July 2016, and Revised February, 2025.

1.2. The primary objectives of the World Bank-funded consulting services for the Multimodal Transport and Trade Logistics Assessment are to assist the Ministry of Infrastructure and Transport (MoIT) in conducting a techno-financial feasibility assessment of Bhutan's inland waterways, ropeway and proposed rail routes. Additionally, the consultancy aims to develop a comprehensive multimodal transport and trade logistics master plan, as well as a detailed railway master plan for Bhutan. These resources are intended to aid in decision-making regarding transport and trade infrastructure investment projects that will enhance the seamless movement of goods, services, and people within Bhutan and regionally across borders, including connections to ports and trade centers in India, Bangladesh, and potentially Nepal.

1.3. The Consultant will support institutional capacity building of the MoIT on select IWT, Aerial ropeway and railway operations and management issues as outlined in the ToR.

1.4. Furthermore, the consultant is tasked with conducting an in-depth review of existing policy and regulatory frameworks. To ensure complementarity and policy coherence, the consultant should coordinate closely with the team working on the ongoing National Transport Policy and Strategy (NTPS). This will help align the multimodal transport assessment with the overarching transport policy framework and avoid duplication or gaps in strategic direction.

1.5. The expected duration of the consulting services is 18 months.

1.6. Further details are included in this Terms of Reference.

2. Monitoring and Evaluation Framework

2.1. The consultant shall establish a framework for monitoring study progress and evaluating the quality of deliverables. This includes periodic reviews and comments by all stakeholders and the MoIT.

3. SCOPE OF SERVICES

3.1. Assignment Objectives

The main objectives of the consulting services are to support MoIT to conduct techno-financial feasibility assessment of inland waterways, aerial ropeways and proposed rail routes and to prepare a multimodal transport and trade logistics masterplan along with a railway master plan of Bhutan to aid

in decision making on investment projects that will facilitate the seamless movement of goods, services, and people across through improved transport and trade logistics infrastructure.

3.2. **Scope of the Assignment**

All items within the scope shall be prepared in close communication with the MoIT and other consultants, especially regarding safeguards related items. MoIT will also organize periodic dissemination of findings to MSPSC and assigned World Bank team for further inputs and guidance.

3.2.1. **Inception Report**

The Consultants will prepare an inception report detailing the items listed below.

3.2.1.1. The Inception Report shall describe how the consultant will source and review the existing reports, documents and related papers, masterplans, expansion plans and synthesize the key initial findings, and demonstrate how this will be a guide to what is now required to be done, and to determine what information is potentially missing and where additional studies/ data collection may need to be conducted.

3.2.1.2. Complete report detailing the consultant's intended means, methods, design standards, reference documents to be used, and assumptions for all items in the scope of work. The report shall effectively demonstrate that the consultant possesses a firm understanding and grasp on the required scope of work.

3.2.1.3. The inception report shall also cover the methodology for how the freight-flow modeling will be conducted, how the techno-financial feasibility assessment of the inland waterways, aerial ropeways and rail routes for freight and passengers will be carried out, and how the strategic locations and investment need for logistics services infrastructure (including, but not limited to, warehouse, dry-ports etc.), as well as the costing (including details on the confidence level of costs) and financial analysis for the feasibility study will be determined.

3.2.1.4. The consultant is required to prepare and implement a stakeholder engagement strategy, and include an outline of this strategy in the Inception Report. The engagement strategy shall illustrate how different stakeholders will be involved throughout the study, including government bodies, local communities, and industry experts. This strategy shall ensure that various stakeholders, including local communities, are actively involved in decision-making processes. Their inputs and concerns shall be integrated into planning and implementation phases, thus reflecting a community-centric approach.

3.2.1.5. The Inception Report shall include a work plan and timeline, providing a detailed schedule of activities, milestones, and deliverables. The timeline shall highlight key phases of the study, from preliminary research through to final reporting.

3.2.1.6. Identification of potential risks and challenges that could affect the study's progress or outcomes, along with mitigation strategies, shall be included, so as to provide clarity on how such issues shall be proactively dealt with so as not to affect the study timeliness and costs.

3.2.1.7. Project Team responsibilities and accountabilities shall be clearly defined for the team members conducting the study, including their roles, and their areas of expertise.

3.2.1.8. Provide a study budget overview outlining the financial plan for the study, including an estimate of costs and allocated resources for various activities.

3.2.1.9. Prepare a quality assurance / quality control (QA/QC) plan. The QA/QC Plan shall contain procedures that will be used to ensure that a quality product is provided for each deliverable and shall list what documentation will be submitted to verify that the procedures have been followed. Include sample checklists, or similar documentation, that will be used to indicate that an internal quality review has been performed, and that these Terms of Reference, the Request for Proposal document, contract modifications, review comments, and any field reports and meeting minutes' action items have been checked against to ensure compliance and incorporation into the design.

3.2.1.10. An Executive Summary shall be included to provide a brief overview of the objectives, scope, and key elements of the study and master plan preparation.

3.2.2. **Capacity Building in Multimodal Transport and Trade Logistics**

3.2.2.1. The consultant shall integrate capacity building into the study, ensuring it remains a focused and integral part of the consultant's scope of work. The consultant shall be responsible for reinforcing the objective and vision of a developed skilled workforce capable of supporting effective and sustainable multimodal transport systems and complex trade logistics.

3.2.2.2. Capacity Building Introduction: As an introduction of capacity building to stakeholders, the consultant shall provide an overview of the importance of capacity building in ensuring the successful development and sustainability of multimodal transport and trade logistics. This introduction shall highlight the benefits of enhancing skills and knowledge among stakeholders of multimodal transport and trade logistics, particularly with a focus on railways and waterways for transport, and the intermodal interface and integration with road and air transport.

3.2.2.3. Assessment of Current Capacity and Needs: One of the first actions by the consultant is to conduct a comprehensive evaluation of existing capabilities among government agencies, transport operators, and relevant stakeholders. This evaluation will identify specific skill gaps and areas requiring development related to the study, to effectively manage and operate integrated transport systems.

3.2.2.4. Capacity Building Training and Development Programs: The consultant shall outline the design and implementation of targeted training programs that address identified gaps, particularly for railway operations and management, aerial ropeway operations and management and waterway transport operations and management, as well as the multimodal management of interface and integration for rail, aerial ropeways, road, air and waterway transport modes. The consultant shall develop curricula and topics for agreement with MoIT prior to implementation. Topics shall include at least the following: logistics management, multimodal operations, interface management, safety standards, technological advancements, and environmental practices. The training sessions shall be comprehensive and include both classroom and hands-on training approaches.

3.2.2.5. Workshops and Knowledge Sharing Events: Workshops and seminars to facilitate knowledge exchange and promote best practices shall be organized and managed by the consultant. International and local experts should be engaged to deliver presentations, and encourage participation in discussions and foster a collaborative learning environment.

3.2.2.6. Knowledge Transfer and Mentorship: Mentoring and the successful transfer of knowledge is important; hence the consultant shall develop strategies for effective knowledge transfer from international experts to local personnel. Establishment of mentorship programs where experienced professionals guide and support their counterparts, shall be established to ensure continuity and skill retention.

3.2.2.7. Institutional Strengthening: Building the capacity of local institutions to plan, manage, and regulate multimodal transport systems shall be a focus of capacity building. Local institutions include government bodies responsible for overseeing national transport policies, planning, and regulations, including multimodal logistics systems. Note that these bodies may be established or be newly established bodies, such as Bhutan Railways Corporation, for example, as well as local port authorities or inland waterways agency; regional transport offices; trade and industry chambers; environmental and urban planning agencies; educational institutions and training centers such as universities, vocational schools etc. and local municipalities etc.

3.2.2.8. Policy Making Process: The consultant shall provide support for enhancing policy-making processes, aid in strategic planning as well as developing institutional frameworks to enable efficient operations.

3.2.2.9. Monitoring and Evaluation of Capacity Building Initiatives: Mechanisms to track and evaluate the impact of capacity building activities shall be implemented and reported upon. The feedback mechanisms and performance indicators will be used to assess progress jointly by MoIT and the consultant, and make necessary adjustments to training programs.

3.2.2.10. Sustainability and Long-term Development: Capacity building efforts need to be sustainable; hence a culture of continuous learning and development needs to be established as part of the capacity building framework. The consultant will encourage partnerships and collaborations between stakeholders to maintain the learning and capacity building momentum and aid participants to adapt to evolving industry requirements.

3.2.2.11. MoIT Railway Training: For railway capacity building, the Consultant shall design a training program for MoIT staff consisting of up to 10 staff. The training set out in Table 1 shall be undertaken over at least face-to-face 80 hours. This training program is aimed at equipping MoIT personnel with a comprehensive understanding of the diverse options for railway industry structure and operations, including asset management such as infrastructure maintenance and renewal. It shall also cover financial support for railway services, technical and economic regulation, and concepts for transnational agreements and treaties. Importantly, the training will include models based on above-rail operations and below-rail operations, including the principles relating to third-party train operators and railway infrastructure maintainers. The railway training shall be designed to inspire and encourage MoIT staff to develop options and determine how Bhutan should execute these responsibilities and provide guidance in implementing them. Part of this implementation involves developing cross-border protocols and standard operating procedures for the management of trains among Eastern South Asian countries, i.e. India and Bangladesh. Additionally, the training program will facilitate engagement with railway counterparts from these countries to become knowledgeable and aware of their methodologies, requirements and expectations, particularly regarding operational rules and regulations, cross-border operations, transiting Bhutan and third-party rail systems, customs and bonding, and railway terminals.

Parameter	Skills
Railway Operations	• Training Programs: Training in the operation and management of railway systems, including scheduling and maintenance. • Capacity Building: Enhancing the capacity of personnel in planning, implementing, and overseeing railway operations.
Technological Integration	• Digitalization: Expertise in the digital technology adoption and automation for better efficiency, safety, and customer service. • Signal and Telecommunications: Sharing knowledge on advanced signaling systems and telecommunication technologies.
Infrastructure Development	• Civil Engineering: Training in track design, construction, and maintenance. • Bridge and Tunnel Construction: Sharing best practices in the construction and maintenance of railway bridges and tunnels.
Rolling Stock Maintenance	• Maintenance: Offering skills training for the maintenance and repair of locomotives, coaches, and wagons. • Workshop Practices: Sharing expertise in establishing and managing workshops for rolling stock maintenance.
Safety and Security	• Safety Protocols: Providing training on safety protocols, accident prevention, and emergency response. • Security Measures: Sharing knowledge on security measures and technologies to safeguard railway assets and passengers.
HR Management	• Training for Railway Personnel: Offering programs on HR management, leadership, and soft skills for railway staff. • Institutional Strengthening: Assisting in the development of robust HR policies and practices.
Financial Management	• Financial Reporting and Analysis: Developing skills in forecasting, resource allocation, and financial goal setting. • Investment Appraisal and Decision Making: Techniques for evaluating the financial viability of railway investments.
Research and Development	• Innovation and Research: Collaborating on research initiatives to drive innovation in railway technology and operations. • Knowledge Sharing Platforms: Establishing platforms for the exchange of research findings and best practices.
Training of Customs Officers	• Specialized Training Modules: Developing targeted training programs for customs officers to enhance their understanding of trade practices, regulatory framework, and digital tools. • Capacity Building Workshops: Organizing workshops to strengthen skills in risk assessment, compliance management, and facilitation of cross border trade.

Source: World Bank Analysis

Table 1. Topics for Rail Capacity Building Program

3.2.2.12. MoIT IWT Training: For IWT capacity building, the Consultant shall design a thorough training program for at least 10 MoIT staff over a period of 40 hours face-to-face training. IWT capacity building will cover (but not limited to) hydrographic survey, waterway development and maintenance, navigation, vessel operations and maintenance, rafting & rescue mechanism, survival and safety, maritime rules and regulations, protocol treaties, IWT freight calculation and environment protection and prevention

3.2.2.13. MoIT Aerial Ropeways Training: For aerial ropeways capacity building, the consultant shall design and deliver a comprehensive training program for at least ten (10) MoIT

staff, regulators, inspectors, and emergency responders through face-to-face training sessions. The consultant will be responsible for developing and implementing a practical, hands-on training and capacity-building program to ensure that government stakeholders are equipped to plan and implement initial projects. In addition, the consultant shall prepare a medium-term and long-term training and capacity-building plan to guide future implementation and scale-up by the Royal Government of Bhutan (RGoB).

3.2.3. Corridor-based Multimodal Transport & Trade Logistics Assessment

3.2.3.1. Undertaking this component will require the Consultant to follow a systematic approach to collecting and reviewing existing findings, conducting additional surveys and data collection, collating the findings and presenting it to a wider audience including the MSPSC and an assigned review team from the World Bank.

3.2.3.2. Key task clusters for this assignment will include the following:

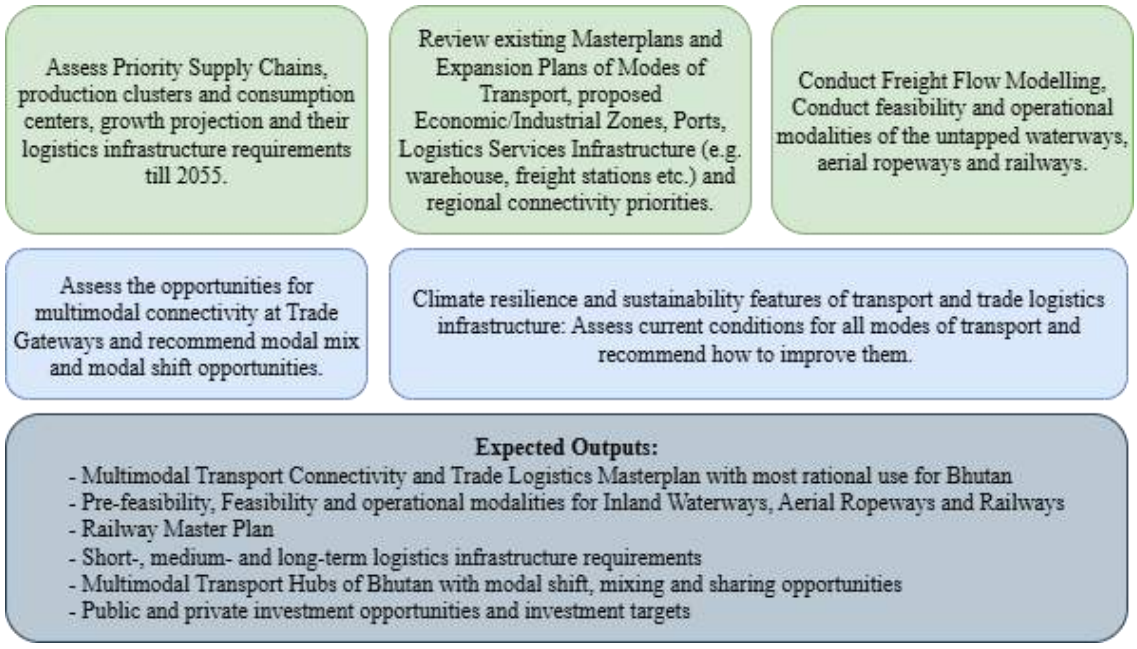


Figure 1. Key task cluster for this assignment

3.2.3.2.1. As outlined in the figure above, the Consultants have to and report as required via the various submissions including the IWT feasibility study, the Aerial Ropeway feasibility study, the Railway Master Plan and the development of the Multimodal Transport and Trade Logistics Master Plan set out in Section 7. of this ToR.

3.2.3.2.2. Conduct parallel assessments, compile the findings, validate them through stakeholder consultation and validation platforms and then triangulate the findings to produce expected outputs.

3.2.3.2.3. Collect, review and collate findings from available local and global resources, stakeholder consultation and validation workshops and shortlist the priority sectors and their supply chains for domestic and international markets. The mix should include current exports, future Global Value Chain, key imports, aggregates, agro-based (perishable) and agro-processing products, among others.

3.2.3.2.4. Collect and review all existing documents, reports, policies, masterplans and protocols related to rail, aerial ropeway and waterway modes of transport, proposed economic zones, ports and logistics services infrastructure.

3.2.3.2.5. Recommend harmonization amongst the masterplans and rationalization of investment based on supply chain efficiency, connectivity and modal mix parameters, amongst others.

3.2.3.2.6. Conduct railway, aerial ropeway and waterway freight flow modeling covering Freight Generation (FG), Freight Trip Generation (FTG), Freight Origin-Destination Synthesis (FODS) Modeling, Traffic Count Data, Supply Chain of Key Sectors, Logistics Costs per sector, FG/FTG Generation Surveys, Distance and Time related costs using Activity Based Costing (ABC), GIS Data, GPS Survey, Travel Congestion Index (TCI), Travel Time Index (TTI), Buffer Time Index (BTI), including border crossing congestion and local and neighbor bureaucracy issues etc. It is considered that the logical sequence of activities is: 1. review existing materials, plans, etc. 2. Develop a freight forecast 3. Conduct freight flow modeling with freight movements flowed over the transport network, based on infrastructure capacity, cost and time parameters. (Network should include main trade corridors through India and Bangladesh for exports and imports.) 4. Use model to identify traffic that has a reasonable probability to divert from road to rail or water, based on adding/changing the links in the freight flow model. 5. Screen the potential links for technical, economic and financial viability of investments. 6. Prepare more detailed technical, economic and financial viability assessment of top priority links, together with other infrastructure (road connections, terminals) to prepare master plan and establish priorities and sequencing. Conduct the modeling as applicable, preferably in partnership with local universities and thereby developing local capacity to repeat the modeling and conduct future freight flow analysis as and when required.

3.2.3.2.7. Assess the climate resilience and vulnerability conditions of railway, aerial ropeway and waterway modes of transport, with particular focus on critical freight corridors and recommend measures and prepare a checklist for climate resilience considerations for any infrastructure development initiative in Bhutan.

3.2.3.2.8. Identify the multimodal hubs for Bhutan, assess readiness and recommend policy and process reforms, infrastructure development and investment requirements to ensure efficient modal shift, modal mix and modal sharing for freight.

3.2.3.2.9. Recommend policy and regulatory measures for transport and trade logistics infrastructure, ensuring coordination with the ongoing National Transport Policy development to maintain strategic alignment and coherence.

3.2.3.2.10. Develop an outline for sub-sectoral strategies for different modes of transport and recommend key measures for consideration and inclusion.

3.2.3.2.11. Undertake Capacity Building in Multimodal Transport and Trade Logistics as set out in section 3.2.2.

3.2.3.2.12. As one of the outputs of this assessment study (i.e., to be included in the Multimodal Transport and Logistics Master Plan), the Consultants will have to prepare efficient freight Logistics Landscape of Bhutan, in both digital and 3D models and project public and private investment opportunities (in USD), and potential Public Private Partnerships (PPPs). While projecting, they also have to suggest where public investment would potentially unleash further private investment so that those opportunities could be prioritized in future development initiatives.

3.2.3.2.13. For techno-financial feasibility study on the Inland Waterways, the Consultant will also have to conduct comprehensive hydro morphological surveys to assess the physical characteristics and dynamics of the rivers. These surveys should include:

3.2.3.2.13.1. Physical Habitat Assessment: Evaluate the physical conditions of the river habitat, including flow patterns and substrate composition, and impact on ecosystems.

3.2.3.2.13.2. Riparian Habitat Assessment: Assess the condition and structure of the riparian zones, which are crucial for maintaining river health.

3.2.3.2.13.3. Morphological Assessment: Analyze the river's channel patterns, cross-section configurations, bed structure and composition, with the aim of maintaining natural hydrological conditions.

3.2.3.2.13.4. Hydrological Regime Assessment: Examine the quantity and dynamics of water flow, including seasonal variations and flood risk, and connectivity to groundwater.

3.2.3.2.13.5. Determine the Least Available Depth during the year with and without intervention. A Bathymetric survey will be required to be conducted for the same.

3.2.3.2.14. For operational modalities of IWT, the recommendations should include, but not limited to, following factors- infrastructure development, navigability and maintenance, hydro morphological surveys, environmental sustainability, economic viability, policy and regulatory framework, capacity building and training, stakeholder engagement, connectivity with India and Bangladesh, funding and financing.

3.2.3.2.15. The techno-financial feasibility of railway should include stakeholder consultation, field surveys and investigations, technical options, cost estimates (with confidence levels advised), and financial modeling and risk assessment. This would also require harmonizing (in volumes of trade) the findings of feasibility studies on the dry ports. Consultant shall analyze the production, mining and trade data by Department of Trade (DoT), Department of Geology and Mines (DGM) and Department of Industry (DoI) to understand the existing and potential cross border freight traffic for each of the proposed dry ports in Bhutan. Based on this, the consultant shall prepare a traffic forecast to [2055] by dry port, with details on the commodities to be handled at each dry port.

3.2.3.2.16. For seamless operations of rail transport, the recommendations should include, but not limited to, the following factors- sustainable infrastructure (i.e. sustainable infrastructure refers to the design, construction, and operation of the railway systems in a way that minimizes environmental impact, enhances social benefits, and ensures long-term economic viability), availability of rolling stock, advanced technology, sources of renewable energy, efficient logistics and operations, stakeholder engagement, regulatory compliance, investment and financing, training and capacity development, maintenance support and regulatory compliance.

3.2.3.2.17. The techno-financial feasibility of aerial ropeways in Bhutan should involve comprehensive technical surveys and analyses, including topographical mapping, geotechnical investigations, seismic and landslide risk assessments, hydrological studies for river crossings, and climate resilience considerations. Demand forecasting must cover both passenger and freight transport, with a focus on community access, tourism hubs, and linking transport gravity points, supported by socio-economic and users' willingness-to-pay surveys. The assessment should provide preliminary designs covering ropeway alignments, station and pylon locations, rope tensioning systems, cabin specifications, and backup power supply needs, benchmarked against international best practices in comparable mountainous regions. Cost estimation must detail capital, operational, and maintenance requirements, while revenue forecasting should model 25-year demand, fare scenarios, and seasonal variations. Financial analysis will determine FIRR, NPV, and viability gap funding needs, alongside risk assessments for natural hazards and operational challenges. PPP potential should be examined through financial modeling, shadow bids, and risk allocation matrices, ensuring alignment with Bhutan's Gross National Happiness principles, carbon neutrality goals, and multimodal transport integration.

3.2.3.2.18. The operational modalities of aerial ropeways in Bhutan should encompass technical, regulatory, financial, and institutional dimensions to ensure long-term sustainability. Operations must prioritize safety, with national regulations and standards adapted from international benchmarks (EU, ANSI, OITAF) and tailored to Bhutan's terrain

and climate conditions. A robust operational framework should address licensing procedures for private operators, maintenance protocols, staff training and certification, and national emergency and rescue management procedures. Integration with road and public transport systems should be emphasized to enable seamless multimodal connectivity, including options for freight cabins and logistics hubs. Revenue and fare policies must balance affordability with financial sustainability, while risk-sharing mechanisms should be built into PPP contracts to attract private investment. Operational models should also consider renewable energy integration, advanced monitoring and control systems, advertising and tourism-linked revenue streams, and transit-oriented development (ToD) opportunities around stations. Finally, institutional capacity-building programs, stakeholder engagement, and phased deployment strategies should be embedded to ensure scalability, efficiency, and alignment with Bhutan's socio-economic and environmental priorities.

3.2.3.2.19. In light of the products that need to be handled through the dry port, Consultant shall propose practical measures for laying out the structure and operations of the dry port and its transport links to address the needs of ensure that the railway terminal and the dry port operate efficiently and effectively together.

3.2.3.2.20. Assessing multimodal connectivity for freight will involve evaluating several key parameters to ensure efficient, reliable, and cost-effective transportation across different modes (e.g., road, rail, aerial ropeway, waterways, air). The primary parameters to consider, should include, but not limited to;

3.2.3.2.20.1. **Infrastructure Quality and Capacity:**

3.2.3.2.20.1.1. Condition and capacity of roads, railways, aerial ropeway, ports, and airports.
3.2.3.2.20.1.2. Availability of intermodal terminals and transfer facilities.
3.2.3.2.20.1.3. Accessibility to major freight corridors and hubs.

3.2.3.2.20.2. **Intermodal Transfer Efficiency:**

3.2.3.2.20.2.1. Speed and ease of transferring goods between modes.
3.2.3.2.20.2.2. Availability of equipment and technology for efficient loading/unloading.
3.2.3.2.20.2.3. Minimization of handling times and costs.

3.2.3.2.20.3. **Regulatory Environment:**

3.2.3.2.20.3.1. Compliance with international and local regulations.
3.2.3.2.20.3.2. Customs and border crossing efficiency.
3.2.3.2.20.3.3. Standardization of procedures and documentation across modes.

3.2.3.2.20.4. **Logistics and Supply Chain Integration:**

3.2.3.2.20.4.1. Integration of logistics services and providers.

3.2.3.2.20.4.2. Coordination between different transportation modes and operators.
3.2.3.2.20.4.3. Use of advanced technologies like RFID, GPS, and IoT for tracking and managing shipments.

3.2.3.2.20.5. **Cost Considerations:**

3.2.3.2.20.5.1. Total transportation cost including handling, warehousing, and transfer fees.
3.2.3.2.20.5.2. Cost-effectiveness of different modal combinations.
3.2.3.2.20.5.3. Availability of competitive pricing and incentives.

3.2.3.2.20.6. **Service Reliability and Speed:**

3.2.3.2.20.6.1. Transit times and punctuality across different modes.
3.2.3.2.20.6.2. Frequency and flexibility of services.
3.2.3.2.20.6.3. Resilience to disruptions and ability to maintain schedules.

3.2.3.2.20.7. **Environmental Impact:**

3.2.3.2.20.7.1. Emissions and energy consumption of different transportation modes.
3.2.3.2.20.7.2. Adoption of sustainable practices and technologies.
3.2.3.2.20.7.3. Policies and incentives promoting green logistics.

3.2.3.2.20.8. **Safety and Security:**

3.2.3.2.20.8.1. Safety records of different transportation modes.
3.2.3.2.20.8.2. Security measures in place to protect goods from theft or damage.
3.2.3.2.20.8.3. Compliance with safety regulations and standards.

3.2.3.2.20.9. **Market Demand and Trends:**

3.2.3.2.20.9.1. Analysis of freight volumes and types of goods transported.
3.2.3.2.20.9.2. Anticipation of future trends and demand changes.
3.2.3.2.20.9.3. Market competition and availability of alternative routes and services.

3.2.3.2.20.10. **Technology and Innovation:**

3.2.3.2.20.10.1. Adoption of digital platforms for booking and managing freight.
3.2.3.2.20.10.2. Use of data analytics and AI for optimizing routes and schedules.
3.2.3.2.20.10.3. Innovations in transportation modes (e.g., autonomous vehicles, drones).

4. THE RAILWAY MASTER PLAN

The requirements for developing a Railway Master Plan as part of the Accelerating Trade and Transport Connectivity in Eastern South Asia (ACCESS) study, aims to optimize Bhutan's rail connectivity by addressing infrastructure gaps, enhancing economic growth, and aligning with sustainable development and the Gross National Happiness (GNH) framework.

4.1. Objectives of Railway Master Plan

4.1.1. The primary objective is to develop a comprehensive Railway Master Plan that enhances Bhutan's transport network by the inclusion of a railway system and infrastructure. This plan will investigate new railway routes and upgrades to existing relative interfacing infrastructure to improve connectivity, economic resilience, and environmental sustainability, following the implementation of the new railway infrastructure.

4.2. Railway Master Plan Scope of Work

4.2.1. Assess the current state and location of railway infrastructure and services interfacing with Bhutan from neighboring India.

4.2.2. Identify and evaluate potential new railway routes and extensions for implementation within Bhutan to provide connectivity with the existing Indian rail infrastructure network.

4.2.3. Provide location details of proposed dry ports, including conceptual drawings of the proposed dry ports tracks, roads and structures associated with the railway link, clearly outlining the required facilities and their respective locations within the dry port premises. The drawings should indicate the placement of key infrastructure such as cold storage units, warehouses, and other related facilities in relation to the railway yard, particularly specifying which facilities need to be located near the yard and identify appropriate locations for others, along with designated areas for vehicle parking and CIQ (Customs, Immigration, and Quarantine) facilities. The overall layout should ensure efficient integration with all modes of transport infrastructure.

4.2.4. Evaluate technical, economic, environmental, and social factors influencing railway development in Bhutan.

4.2.5. Determine the Economic Analysis and conduct cost-benefit analysis, exploring economic viability, financing options, and potential economic impact.

4.2.6. Propose project options with technical specifications and investment requirements for the rail infrastructure development in Bhutan.

4.3. Railway Master Plan Methodology

4.2.1. Utilize data collection and advanced rail operations modelling techniques for analysis.

4.2.2. Incorporate stakeholder engagement through consultations, workshops, and feedback sessions. This includes stakeholders within Bhutan and those in interfacing regions outside of Bhutan.

4.2.3. Conduct site visits and detailed field studies to obtain relative ground-level data and insights.

4.2.4. To assess the realistic whole of life development costs and cost-benefit analysis of railway infrastructure in Bhutan, particularly for proposed railways that will interface with Indian Railways, the consultant will need to access relevant costing data and employ a proven structured approach. The consultant shall consider all costs associated with the railway's lifetime, including initial construction, ongoing maintenance, and potential upgrades over the initial 25-year period, and undertake cost-benefit analysis of each infrastructure proposal, for ranking purposes.

4.2.5. The approach to robust costing shall include at least the following sources:

4.2.5.1. Government Agencies and Ministries including Ministry of Infrastructure and Transport (MoIT) - responsible for transport and logistics infrastructure development, offering insights into current projects and cost standards; and Ministry of Finance for data on budgeting, funding mechanisms, and financial policies related to infrastructure development.

4.2.5.2. Indian Railways for cost data, technical standards, and operational benchmarks, as well as historical data on rail construction, maintenance, and cross-border connectivity projects.

4.2.5.3. Review feasibility studies conducted by Bhutanese authorities or international bodies such as World Bank, Asian Development Bank (ADB) and others, which often include detailed cost analyses.

4.2.5.4. Engagement with engineering and consulting firms that have experience with railway projects in similar terrains in the surrounding region.

4.2.5.5. Conducting market surveys to gather current pricing for materials, labor, and railway-specific equipment from local and regional suppliers.

4.2.5.6. Reference reports from the ADB, World Bank, or other international organizations that publish infrastructure development case studies and cost analyses.

4.4. Key Deliverables

4.4.1. The consultant shall refer to the sub-deliverables outlined in Section 14.5 and ensure their integration into the appropriate format as specified in Section 14.4. It is essential that each sub-deliverable is prepared in accordance with the respective scope, methodology, and other requirements relevant to each transport mode.

4.5. Stakeholder Engagement Strategy – Inclusions

4.5.1. The stakeholder engagement strategy shall include engagement with government agencies, local communities, industry stakeholders, Indian railways and India government bodies as appropriate, and other international partners. Regular updates and feedback loops are to be maintained to ensure inclusiveness and responsiveness.

4.6. Monitoring and Evaluation Framework

4.6.1. Establish mechanisms for regular monitoring of study progress and deliverable quality. Include a regular update of progress and findings in the Monthly Progress Report.

5. FEASIBILITY STUDY ON BHUTAN'S INLAND WATERWAY TRANSPORT (IWT)

The framework for conducting a comprehensive feasibility study on Bhutan's Inland Waterway Transport (IWT) as part of the World Bank's Accelerating Trade and Transport Connectivity in Eastern South Asia (ACCESS) initiative aims to explore the viability of developing an inland water transport system to enhance trade and connectivity within Bhutan and with neighboring countries.

5.1. IWT Feasibility Study Objectives

5.1.1. The primary objective of the feasibility study is to assess the technical, economic, environmental, and social feasibility of developing inland waterways in Bhutan. The study will identify potential routes, evaluate existing IWT infrastructure and future infrastructure requirements, and recommend strategies for integrating IWT into Bhutan's broader transport network.

5.2. IWT FS Scope of Work

5.2.1. The scope of work for the IWT feasibility study (the study) is extensive. The study of the 8 rivers of Bhutan potentially identified by the World Bank in 2014 shall be conducted in two stages, the pre-feasibility and feasibility. The objective of the pre-feasibility stage is to determine if the river has sufficient discharge, suitable gradient and morphology for developing it into a waterway. The pre-feasibility stage shall also include a detailed hydrographic survey to assess the navigability of the waterway, height of structures across the river and strength of current. If the conclusion of the pre-feasibility is positive then the feasibility study shall be undertaken of that river.

5.2.2. The initial activity shall be to determine, analyse and report on the current locations, state and conditions of existing waterways, including hydrological data, detailed hydrographic survey data, navigability, and infrastructure.

The following activities stem from the initial review and include:

5.2.2.1. Route Identification: Identify and prioritize potential routes for inland waterway development based on strategic importance and feasibility.

5.2.2.2. Technical Assessment: Evaluate technical specifications for waterway infrastructure development, including classification of the waterway, dredging, port facilities, and navigation aids appropriate to the class of the waterway.

5.2.2.3. Inland Waterway Port Details: Provide location details of proposed IWT ports, including conceptual drawings of the proposed dry ports layout, roads and structures associated with IWT, clearly outlining the required facilities and their respective locations within the port premises. The drawings should indicate the placement of key infrastructure such as cold storage units, warehouses, and other related facilities in relation to the dry port, particularly specifying which facilities need to be located near the dock and identify appropriate locations for others, along with designated areas for vehicle parking and CIQ (Customs, Immigration, and Quarantine) facilities. The overall layout should ensure efficient integration with all modes of transport infrastructure.

5.2.2.4. Infrastructure Costs: Following the technical assessment, determine the costs of all proposed waterway infrastructure developments. Costs shall have a confidence level sufficient to conduct a meaningful economic analysis that is valid for a 15-to-25-year investment profile. (Note: See Railway Master Plan for further details on costing and sources of cost.)

5.2.2.5. Economic Analysis: Conduct a cost-benefit analysis, exploring economic viability, financing options, and potential economic impact.

5.2.2.6. Environmental and Social Impact Assessment: Analyze potential environmental and social impacts, including mitigation strategies aligned with sustainable development goals.

5.2.2.7. Environmental and Social Impact Improvement Opportunities: Identify and propose strategies to enhance positive environmental and social outcomes, such as habitat restoration projects, pollution reduction initiatives, and community engagement programs that foster sustainable development and enhance local quality of life.

5.2.2.8. Community Use Development Opportunities: Explore avenues for integrating the transport waterways into the daily lives of local communities, such as by improving access to water transport for commuting, supporting local businesses, and facilitating the transport of goods to enhance regional connectivity and accessibility.

5.2.2.9. Commercial Development Opportunities: Identify potential for commercial activities along the transport waterways, including the establishment of new business hubs, logistics centres, and support facilities that can leverage waterway transport to boost trade and economic growth.

5.2.2.10. Recreational Opportunities: Propose the development of recreational areas and activities along and on transport waterways, such as parks, walking trails, boating, rafting, and fishing opportunities, to promote tourism and local leisure activities, contributing to the overall well-being and economy of the region.

5.2.2.11. Regulatory and Institutional Framework: Assess existing regulatory and institutional structures, recommending necessary reforms or enhancements to support IWT.

5.3. IWT FS Methodology

5.3.1. Data Collection: Gather primary and secondary data through site visits, bank to bank hydrographic surveys after establishing benchmarks, satellite imagery, and interviews with stakeholders.

5.3.2. Stakeholder Consultations: Conduct workshops and meetings with government agencies, local communities, industry experts, and international partners.

5.3.3. Modeling and Simulation: Use hydrodynamic models to simulate navigability and infrastructure scenarios.

5.3.4. Costing of IWT Infrastructure: In Bhutan, undertaking a realistic assessment of waterway transport infrastructure development costs for a 15 to 25-year period requires accessing relevant costing data and following a structured approach. Sourcing for costing data shall include:

5.3.4.1. Government Agencies: Obtain data from agencies, such as Department of Surface Transport and Ministry of Infrastructure and Transport, and Ministry of Industry, Commerce and Employment, which may have historical and current data on infrastructure projects.

5.3.4.2. Local and International Case Studies: Study past and ongoing waterway projects within Bhutan and in other countries with similar geographic and economic profiles.

5.3.4.3. Public Enterprises and NGOs: Entities like the Bhutan Power Corporation may provide insights, especially if projects overlap with energy infrastructure.

5.3.4.4. Consulting Firms and Engineering Companies: Collaboration with firms that have conducted feasibility studies or implemented similar projects in the region.

5.3.4.5. Market Research: Gather data on costs of materials, labor, and equipment through local suppliers or industry publications.

5.3.4.6. International Databases and Reports: Use of World Bank, Asian Development Bank (ADB), and UN reports on infrastructure projects to gain data on international best practices and benchmarks.

5.3.5. Reporting and Costing of IWT Development Opportunities: The consultant shall provide a report on each of the various development opportunities mentioned including preliminary cost estimates for each of the recommendations.

5.3.5.1. Environmental and Social Impact Improvement Opportunities:

5.3.5.1.1. Conduct baseline studies to understand existing environmental and social conditions.

5.3.5.1.2. Consult with environmental experts and social planners to identify feasible improvement projects.

5.3.5.1.3. Engage with local communities and stakeholders to gather insights and preferences.

5.3.5.2. Community Use Development Opportunities:

5.3.5.2.1. Assess the current usage patterns and future needs of communities along the waterways.

5.3.5.2.2. Identify potential community-led projects, such as local transport services, markets, or educational initiatives.

5.3.5.2.3. Provide recommendations for different community projects with scalability options.

5.3.5.3. Recreational Development Opportunities:

5.3.5.3.1. Evaluate potential sites for recreational development and their current use.

5.3.5.3.2. Collaborate with tourism boards for input on enhancements that align with local tourism strategies.

5.3.5.4. Commercial Development Opportunities:

5.3.5.4.1. Study existing commercial activities along the waterways and forecast potential growth areas.

5.3.5.4.2. Liaise with business chambers and commercial entities to understand their needs and investment interests.

5.3.6. The approach for costing should include the use of case studies of similar environmental, community, recreational and commercial projects for cost estimates, including communication and cooperation with NGOs and environmental agencies, local government and community organizations, and local businesses for potential funding contributions or partnerships. The cost report should include a prioritized list of recommendations with estimated initial costs for project phasing and planning.

5.3.7. For commercial development opportunities, reference costs from local infrastructure projects should be obtained and used for the preliminary cost estimates, with any adjustment for any sector-specific needs as required. Use financial and economic modelling for project costs associated with infrastructure that supports commercial projects and commerce, such as warehousing, fueling facilities, ports and logistics hubs.

5.4. IWT FS Key Deliverables

5.4.1. The consultant shall refer to the sub-deliverables outlined in Section 14.6 and ensure their integration into the appropriate format as specified in Section 14.4. It is essential that each sub-deliverable is prepared in accordance with the respective scope, methodology, and other requirements relevant to each transport mode.

6. AERIAL ROPEWAY AND SCOPING FEASIBILITY FOR BHUTAN

The framework for conducting a comprehensive feasibility study on Bhutan's Aerial Ropeway system as part of the World Bank's Accelerating Trade and Transport Connectivity in Eastern South Asia (ACCESS) initiative aims to evaluate the feasibility and potential benefits of introducing aerial ropeways in Bhutan. By providing a comprehensive analysis of the tasks involved, we can ensure that the implementation of this innovative transport solution aligns with the country's development goals and contributes to the overall well-being of its people

6.1. Aerial Ropeway Feasibility Study Objectives

The primary objective of the feasibility study is to:

6.1.1. Analyze and document potential benefits (and disbenefits) of introducing aerial ropeways as a transport mode in Bhutan both for passengers and freight.

6.1.2. Identify promising corridors for implementing/introducing aerial ropeway project(s).

6.1.3. Conduct preliminary feasibility study for a handful of aerial ropeway project(s).

6.1.4. Develop an evidence-based, actionable roadmap for the safe, sustainable, and scalable implementation of aerial ropeway transport in Bhutan, providing recommendations on regulations, technical standards, safety, licensing, PPPs, and integration with existing transport systems, aligned with national policies, international best practices, and stakeholder priorities.

6.2. Aerial Ropeway Feasibility Scope of Work

6.2.1. Task 1: Conduct an initial analysis on aerial ropeways for Bhutan based on literature, consultation, and secondary data.

6.2.1.1. **Review relevant geographic and terrain related information**.

6.2.1.1.1. Assess topographical and structural conditions (e.g., hills, rivers, forests, dense areas) that could be overcome by cable cars.

6.2.1.1.2. Assess relevant geographic data, weather patterns, climate, geological condition, and tectonic information that may impact aerial ropeway feasibility.

6.2.1.1.3. Review the hazard and disaster data and model predictions for Bhutan.

6.2.1.2. **Conduct a demand analysis considering both passengers and freight.**

6.2.1.2.1. Analyze Bhutan's transport network, availability of modes and provisions to identify service gaps.

6.2.1.2.2. Use currently available demand data, traffic models to predict and assess ropeway demand. The consultant may use other relevant secondary sources (like population, GDP, urbanization, commercial activity, public transport growth, Five Year Plans (FYPs) etc.) to cross check and validate findings. IT must separately assess tourism data to investigate the extent of aerial ropeway transport demand to cater to tourists at high-frequency sites.

6.2.1.2.3. Analyze supply and demand fluctuations (daily, weekly, seasonal).

6.2.1.2.4. Forecast future demand at national level and at segregated, local level considering variation of travel pattern at regional and local level. Highlight key features of the demand pattern.

6.2.1.3. **Use Case Identification**

Enlist and highlight the use cases for Bhutan combining passenger and freight transport, including mixed-use or dedicated goods cabins. Determine the predicted share of each case from the national predicted demand. Also assess Public Private Partnership (PPP) potential for each use case.

6.2.1.3.1. Define the use cases for Bhutan that have clear economic benefits for Bhutan. Based on the consideration of various use cases and examples, the consultant will make use of relevant data (Tasks 6.2.1.1 and 6.2.1.2) including major trip generators, public transport system, tourism pattern, infrastructure especially road network, population dispersion etc. The analysis would identify the use cases that can benefit the transport system in Bhutan and to what extent. The minimum use cases to be considered are as follows:

6.2.1.3.1.1. *Community access:* Provide access to the larger transport network by connecting communities to the existing transport network. This would mean not having to construct roads from the community habitat to the transport connector. This would be the relieve/extend/connect scenario in Figure 2.

6.2.1.3.1.2. *Tourist location access:* Ease/shorten/simplify the connection to a tourist location. Examples include but not limited to, Paro Taktshang, Phajoding, and Tango and Cheri monasteries, which are prominent tourist locations without access to road-based mobility. These locations may have commercial viability and should be explored as PPP modality options.

6.2.1.3.1.3. *Transport network:* creates a public transport network through cable cars without having to support road based public transport or individual car ownership requirements

within the network. This too has a high likelihood of revenue generation and should be explored as a PPP operation besides as public delivery mode.

6.2.1.3.1.4. *Connect two transport gravity points:* allows connecting two points without having to connect them via roads. This may be a scenario when both sides of the missing link are well connected but the bridging makes more sense aerially than on land due to site condition.

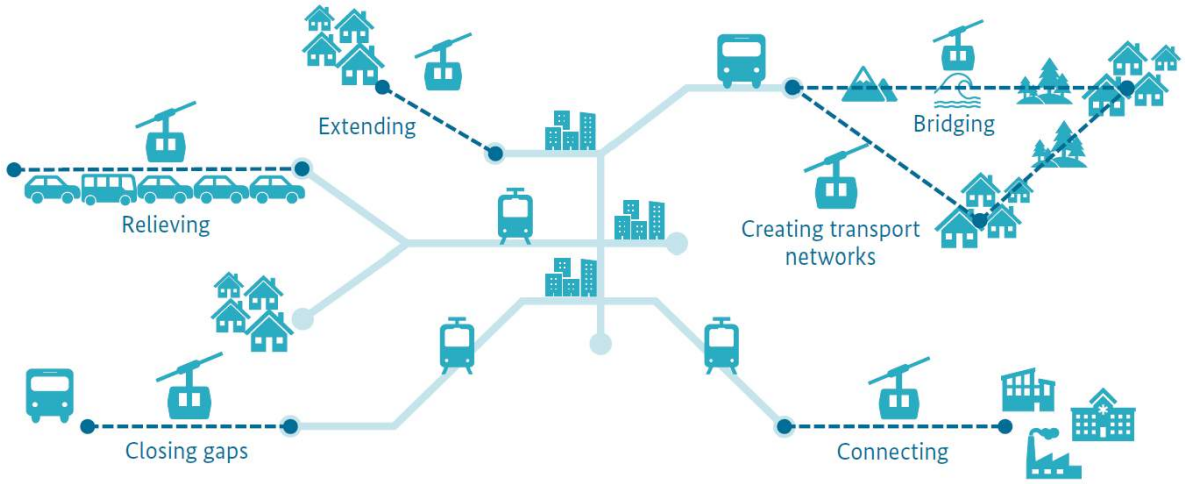


Figure 2. Use cases for aerial ropeway transport

6.2.1.3.2. Assess scenarios like mass deployment, phased introduction, specific use case eligibility. If specific cases or phase mass deployments are recommended, determine how projects can be identified and selected for approval (a framework or set of criteria developments for the DoST to decide).

6.2.1.4. **Gather stakeholder inputs, perception, and feedback.**

6.2.1.4.1. Identify key stakeholders (public authorities, potential investors, potential operators, experts, users, beneficiary communities etc.).

6.2.1.4.2. engage with the stakeholders to hear their views on introducing aerial ropeways transport in Bhutan.

6.2.1.4.3. Assess capacity of the relevant public and private sector entities to identify capacity status, gaps and enforcement needs.

6.2.1.4.4. Gauge the user's willingness to pay for new modes of transportation to inform the revenue generation potential. The consultant may conduct a brief survey (online or telephone) to conduct the survey. It should cover a diverse audience and should separately focus on passengers and freight.

6.2.1.4.5. Among the stakeholders, specific feedback needs to be collected from the potential investors in such a system to learn their interests, concerns, enabling environment and willingness to invest.

6.2.1.4.6. Collect views on privacy and noise concerns, especially for routes over residential areas.

6.2.1.5. **Case Studies and early deployment experiences**

6.2.1.5.1. Analyze international examples and extract lessons for Bhutan. It may choose three examples from Nepal, India, and Bolivia (e.g., Mi Teleférico in La Paz/El Alto) or other three markets considering similarity with Bhutan.

6.2.1.5.2. Extract lessons on system types, operational parameters, integration, and challenges.

6.2.1.5.3. Identification of Economic and Business Opportunities, and the extent to which the investment in ropeways has paid off for these countries. Especially highlight how Bhutan can reap the benefits with optimum investment. Also mention the enabling conditions that brought success in these markets, and the barriers that hindered the investment from bringing the full benefits as desired.

6.2.1.5.4. Assess economic efficiency, including energy consumption and space requirements.

6.2.1.5.5. Explore funding mechanisms and financial assistance options.

6.2.1.5.6. Analyze total cost of ownership (location, configuration, stations, operating hours, speed, energy).

6.2.1.5.7. Consider advertising and tourism potential for additional revenue.

6.2.2. **Task 2: Identify list of projects and corridor level analysis**

6.2.2.1. **Criteria setting and development of the list**

6.2.2.1.1. Based on Task 1 outputs, develop an appropriate framework and methodology for identifying a list of potential aerial ropeway projects/corridors in Bhutan. The framework will consider both passenger transport, freight, and mixed use.

6.2.2.1.2. Identify a long list of potential ropeway corridors nationwide, including urban, peri-urban, inter-urban, rural and tourism/religious sites.

6.2.2.1.3. Conduct rapid screening and prioritization to select corridors for further analysis and high-level feasibility review.

6.2.2.2. **Demand analysis**

6.2.2.2.1. Review the relevant information to determine demand of each corridor which may include the following – current travel pattern, growth of travel demand, population dispersion, major economic activities, tourism pattern, trading activity, planned investments (both by public sector and private sector) around the corridor.

6.2.2.2.2. Further analyze and specify the demand profile (commuters, tourists, goods transport), expected seasonal variation, and sensitivity for each corridor.

6.2.2.2.3. Cross reference and further validate the demand data, collect any missing data if necessary to complete the validation process.

6.2.2.3. **Cost assessment and technical analysis**

6.2.2.3.1. Propose preliminary ropeway alignment options for each shortlisted corridor, considering terrain, land use, and environmental sensitivity.

6.2.2.3.2. Propose the type of ropeway considering the demand and site conditions.

6.2.2.3.3. Draft initial layout of the corridor; identify access points, stations, pylon locations, foundation, and cabin size.

6.2.2.3.4. Provide high-level technical specifications (length, stations, span, capacity, technology type).

6.2.2.3.5. Define the rope hauled systems for the project. It will include cabin type, arrangement, movement etc. It will also include cable arrangement (monocable versus 1+ cable systems), cable specifications.

6.2.2.3.6. Estimate preliminary capital costs (infrastructure, equipment, civil works) and operating & maintenance costs using benchmarks from comparable projects. To the extent possible, the estimate should be context sensitive, for example should include shipping charges to Bhutan and the corridor site for imported items. Another example would be scale impact, leading to high prices if only few projects are initiated at the beginning.

6.2.2.3.7. Estimate preliminary capital costs (infrastructure, equipment, civil works) and operating & maintenance costs using benchmarks from comparable projects.

6.2.2.4. **Revenue and Public Private Partnership (PPP) potential**

6.2.2.4.1. Estimate revenue potential for each corridor, considering fare structure and willingness-to-pay. Show comparison with other comparable markets, sectors and transport modes.

6.2.2.4.2. Assess financial viability indicators (e.g., FIRR at high level).

6.2.2.4.3. Identify corridors with potential for PPP delivery, noting investor interest and possible government support needs (subsidy, viability gap funding).

6.2.2.5. **Benefits and impact assessment**

6.2.2.5.1. Assess expected socio-economic benefits: improved accessibility, reduced travel time, tourism boost, job creation, higher value of farm produce, regional connectivity, and other relevant.

6.2.2.5.2. Assess environmental, social and climate benefits (low-carbon transport, avoided road/bridge construction, avoided forest clearance, avoided land acquisition).

6.2.2.5.3. Identify social inclusion impacts (access for remote communities, women, vulnerable groups).

6.2.2.6. **Risk and hazard analysis**

6.2.2.6.1. Identify key risks combining natural hazard risks like geological, seismic, landslide, flooding, wind, fire etc. with stakeholder risks like maintenance, capacity, investor interest (for PPP candidate) or other. Assess the

6.2.2.6.2. Conduct high-level risk and hazard analysis for each corridor.

6.2.2.6.3. Provide mitigation considerations at the feasibility stage. Determine if further data collection would be needed mitigation at specific locations. Assess high level risk and hazard mitigation costs.

6.2.2.7. **Economic and financial analysis**

6.2.2.7.1. Conduct high-level economic analysis (EIRR) using costs and benefits.

6.2.2.7.2. Conduct high-level financial analysis based on O&M costs, revenues, and required subsidies.

6.2.2.7.3. Provide comparative ranking of corridors on economic and financial grounds.

6.2.2.7.4. Compare and rank corridors based on demand, costs, benefits, risks, PPP potential, spatial importance considering 13th FYP or other national plan, and social/environmental alignment.

6.2.2.7.5. Conclude the analysis by proposing a short-list of projects for feasibility study. Present the projects to the client to collect feedback and agree on the shortlist.

6.2.3. **Task 3: National regulations and deployment roadmap. If Task 2 identifies at least a few promising/beneficial corridors for Bhutan then the consultant shall prepare the**

necessary procedural documents to facilitate the safe, sustainable, and scalable implementation of aerial ropeway transport in the country.

6.2.3.1. **Implementation roadmap**

6.2.3.1.1. Compile transport sector available policies, project information, master plans etc. to establish baseline.

6.2.3.1.2. Compile and integrate relevant policy and project documents like Bhutan Transport 2040 Integrated Strategic Vision, Nationally Determined Contribution (NDC), Draft National Surface Transport Policy 2024, Low Emission Development Strategy for Surface Transport 2021, 13th five-year plans.

6.2.3.1.3. Consult with relevant stakeholders including the Ministry of Infrastructure and Transport (MoIT), Bhutan and the consultancy firm engaged for 'Developing a National Transport Policy, Strategy Surface Transport Bill/Act and Aviation Bill/Act for Bhutan'.

6.2.3.1.4. Define outline for aerial ropeway in Bhutan: use cases, comparative advantages (access, connectivity, tourism, urban mobility, rural accessibility), sustainability, safety, economic considerations, financing, institutional arrangements and private sector roles for PPP in the sector.

6.2.3.1.5. Additionally assess and recommend planning, operations and other design considerations for the public transport system to provide seamless experience to the users of the ropeway system. This may include suggestions and considerations for other transport projects and plans to increase ropeway ridership and revenue. These recommendations to integrate the ropeway with public transport and other transport projects/plans will similarly be made available to the National Transport Policy consultancy for consideration and integration in their policy suggestion.

6.2.3.1.6. Provide a comprehensive roadmap to implement short-, medium- and long-term goals, predicted evolution of the sector, enabling factors, financing, funding, risks, institutional and capacity needs across the stakeholders including the private sector players.

6.2.3.1.7. Include sequencing of policy adoption, capacity development, pilot projects, institutional strengthening, and scaling-up.

6.2.3.1.8. Provide an investment requirement estimate and resource mobilization strategy (domestic, donor, PPP financing).

6.2.3.2. **Regulations, operations standards, technical standards and specifications.**

The consultant will identify and document a full set of legal requirements, technical documentations, planning and operations procedure for Bhutan at this stage.

6.2.3.2.1. Review and compile existing Bhutanese transport Acts, rules, environmental laws, PPP framework, and local government legislation.

6.2.3.2.2. Separately assess safety regulations in Bhutan from relevant sector (such as fire safety, road safety, construction site safety measures)

6.2.3.2.3. Review key regulations from international examples. A few examples are provided below, but the review needs to be exhaustive and fit for purpose considering Bhutan:

a) European Union. The Regulation (EU) 2016/424 of the European Parliament and of the Council of 9 March 2016 on cableway installations and repealing Directive 2000/9/EC.

b) United Kingdom. The Cableway Installations Regulations 2018 (SI 2018/816).

c) United States. ANSI B77.1-2022.

d) OITAF (International Organization for Transportation by Rope) recommendations.

6.2.3.2.4. Propose integration pathways for ropeway regulation within existing Acts or recommend new legislative instruments if required. If some of the international regulations are acceptable considering Bhutan conditions, the consultant may propose accordingly. In any case a full list of regulations needs to be provided which will indicate coverage, implementing roles, source (direct use of international regulations vs. adapted from international regulations vs. separately drafted for Bhutan as the international regulations are inadequate or not applicable).

6.2.3.2.5. Separately specify and highlight the safety aspects including the following:

6.2.3.2.5.1. Safety requirements tailored for Bhutan (design, construction, operation, maintenance, inspections, certifications).

6.2.3.2.5.2. Incident and accident management procedures, including investigation protocols and reporting obligations.

6.2.3.2.5.3. Standard national rescue and emergency management procedure in coordination with relevant national (i.e., Bhutan Construction and Transport Authority) and local authorities (i.e., Thromde, Dzongkhag, Gewog).

6.2.3.2.6. Review and identify potential natural hazards like wind load, earthquake, ice/snow, lightning. Map regional distribution of such hazards. Specify mitigation measures and considerations for all projects.

6.2.3.2.7. Explore international specifications to help determine if suitable for Bhutan conditions. However, the consultant should review such specifications in great detail,

consider for Bhutan conditions in all possible manners including disaster resilience and safety to demonstrate clear rationale in favor of their recommendations. Alternatively, develop design and technical specifications for aerial ropeways in Bhutan (aligned with international standards but contextualized to Bhutan's terrain, seismicity, climate, and biodiversity sensitivities).

6.2.3.2.8. Recommend minimum requirements for contractors, suppliers, and operators (certifications, ISO compliance, maintenance obligations). The approach may be similar to the determination of technical specifications with an assessment of international practices to suggest if such can be adopted for Bhutan.

6.2.3.3. **Licensing, PPP and Revenue Policy**

6.2.3.3.1. Draft a Private Operator Licensing framework including eligibility, application process, safety certification, and renewal procedures.

6.2.3.3.2. Review and align with Bhutan's PPP framework; propose suitable PPP models (BOT, BOOT, concession agreements). Provide adequate analysis and detailed information to the authorities to initiate, sustain and scale up PPP operations for aerial ropeways.

6.2.3.3.3. Develop a Revenue & Fare mechanism that balances financial sustainability, affordability, and service quality.

6.2.3.3.4. Propose risk-sharing mechanisms for public–private partnerships (tariff risk, ridership risk, safety liability).

6.2.3.4. **Consultation & Validation (for Tasks 6.2.3.1, 6.2.3.2 and 6.2.3.3)**

6.2.3.4.1. Organize national stakeholder workshops to present draft regulations, and roadmap (at least three, at different stages of the study).

6.2.3.4.2. Incorporate feedback from government agencies, private sector, civil society, and local communities.

6.2.3.4.3. Produce an Implementation Roadmap, validated at national level.

6.2.3.5. **Institutional Capacity & Training (for Tasks 6.2.3.1, 6.2.3.2 and 6.2.3.3)**

6.2.3.5.1. Conduct a stakeholder assessment to map relevant agencies, private sector actors, and community groups.

6.2.3.5.2. Develop a Public Sector Management Plan to define roles, responsibilities, and monitoring mechanisms. Draft relevant operational procedures and manuals as necessary to aid the government to roll out and sustain the new mode of transport.

6.2.3.5.3. Prepare a Training & Capacity-Building Plan for regulators, inspectors, and emergency responders.

6.2.3.5.4. Develop and implement a hands-on training and capacity building program for the government to ensure that the government stakeholders are ready to plan and implement the initial projects.

6.2.3.5.5. Draft a medium-term and long-term training and capacity building plan for future implementation and scale-up by RGoB.

6.2.4. Task 4: Detailed design, feasibility and project concept report (for the 3 most feasible aerial ropeways project identified through Task 2)

6.2.4.1. Data Collection and Baseline Analysis

6.2.4.1.1. Topographic Surveys: Digital terrain models, station locations, and alignment mapping. This may involve drone survey-based survey instead of physical data collection.

6.2.4.1.2. Geotechnical Investigations: Boreholes, soil/rock testing, landslide risk analysis, rockfall risk, seismic hazard assessment.

6.2.4.1.3. Hydrological Studies: River crossings, drainage, flood risks.

6.2.4.1.4. Traffic and Demand Surveys: Passenger counts, origin–destination surveys, seasonal/tourism demand surveys, willingness-to-pay studies.

6.2.4.1.5. Socio-Economic Surveys: Household surveys, stakeholder consultations, local business/tourism operator inputs.

6.2.4.1.6. Environmental and Social Baseline Studies: Sensitive habitats, protected areas, cultural heritage, resettlement needs.

6.2.4.2. Corridor Alignment and Technical Design

6.2.4.2.1. Identify and refine ropeway alignment alternatives. Determine rope tensioning counterweight configuration and rope tension factor of safety.

6.2.4.2.2. Prepare preliminary station locations (drive, return and turnaround) and design, tower locations, depot, and access infrastructure design.

6.2.4.2.3. Assess integration with road networks, public transport networks including bus services, pedestrian connectivity, and tourism infrastructure. The possible integration of logistics activities is yet another area worthy of investigation and analysis. Additionally, stations should be analyzed for Transit oriented Development (ToD) considerations.

6.2.4.2.4. Assess pylon type (tubular or lattice steel or other), develop design including foundation design.

6.2.4.2.5. Evaluate and confirm ropeway technology options identified for this corridor through task 2 (monocable, bi-cable, tri-cable, freight capability if relevant).

6.2.4.2.6. Specifications for the following:
a) Cabin
b) Roller battery specifications.
c) Backup power supply need and generator specifications.
d) Ground clearances in urban and rural settings.
e) Cabin size, number of seats, width.
f) Design/specification of the grips.

6.2.4.2.7. Design of the cable car control system to monitor the safety of the installation, displaying real-time data and all necessary information on a system dashboard.

6.2.4.2.8. Prepare preliminary engineering designs with drawings (alignment profile, tower/station layout, access roads, utilities).

6.2.4.3. **Cost estimation**

6.2.4.3.1. Develop detailed capital cost estimates (civil works, equipment, cabins, IT systems, traffic control, land, resettlement, environmental mitigation, utilities).

6.2.4.3.2. Estimate operating and maintenance costs including staffing, spare parts, energy requirements.

6.2.4.3.3. Benchmark costs against similar international ropeway projects (especially compare with costs from similar terrain conditions in India and Nepal).

6.2.4.3.4. Minimum operating team composition, staff qualifications and responsibilities.

6.2.4.3.5. Draft operations plan including staff shifting and rotation plan.

6.2.4.3.6. Include power, staffing, maintenance and other costs during the operations period.

6.2.4.4. **Demand and Revenue Forecasting**

6.2.4.4.1. Determine peak hour peak direction demand. Estimate hourly and seasonal demand to determine yearly estimated demand.

6.2.4.4.2. Assess power demand and supply status. Separately analyze wet and dry season power status for the project location(s). Assess yearly power supply cost considering local power supply forecast in the wet season and imported power in the winter season. This should be assessed for the life cycle with discounted value of each yearly cost.

6.2.4.4.3. Prepare 25-year demand forecasts based on updated traffic and tourism growth models.

6.2.4.4.4. Assess fare scenarios and willingness-to-pay for different user groups.

6.2.4.4.5. Prepare projected annual ridership and revenue forecasts.

6.2.4.5. **Economic, financial analysis, and PPP potential**

6.2.4.5.1. Conduct detailed economic analysis.

6.2.4.5.1.1. Estimate access benefits, travel time savings, vehicle operating cost savings, accident reduction, tourism benefits, job growth, environmental benefits, avoided emissions, regional development impacts.

6.2.4.5.1.2. Compute Economic Internal Rate of Return (EIRR), Net Present Value (NPV), and Benefit-Cost Ratio (BCR).

6.2.4.5.2. Conduct detailed financial analysis.

6.2.4.5.2.1. Estimate project FIRR, NPV, DSCR.

6.2.4.5.2.2. Assess sensitivity to demand, cost overruns, and tariff assumptions.

6.2.4.5.2.3. Evaluate PPP delivery potential for each project: structuring options, risk-sharing framework, and potential investor appetite.

6.2.4.5.2.4. Define requirements for subsidy or viability gap funding.

6.2.4.5.3. Evaluate PPP delivery potential: structuring options, risk-sharing framework, and potential investor appetite.

6.2.4.6. **Financial modeling and viability assessment**

If there at least is a project with PPP potential. Assess the financial viability of each PPP candidate project by performing the following tasks:

6.2.4.6.1. **Financial Model**

Build a financial model (also known as a "shadow" model), which will be used as a standard financial model for the project, and must be created as 'virtual bid', based on the same output specifications assumed in the PPP structure. The Consultant should use their experience and econometric modeling to determine the rate of return expectations of the potential private sector bidder and thereby determine the 'virtual bid'. It must therefore cover the same categories of whole life-cycle costs, within comparable contract period(s). The financial modeling should consider the following: -

6.2.4.6.1.1. Economic cost benefit analysis of the project and alternative technical solutions;

6.2.4.6.1.2. Determination of revenue requirements to meet project funding needs;

6.2.4.6.1.3. Determination of necessary tariff levels for the user pays project; alternatively, given the assessed market demand (volume) and the recommended user charges, determine the 'viability gap funding' required to attract private sector investment to the project;

6.2.4.6.1.4. Evaluation of economic justification for implementing the project through PPP model, at different levels of 'viability grant funding' from the Contracting Authority (CA).

6.2.4.6.1.5. Evaluation of affordability for user pays and/or public sector pays models including fiscal and public sector borrowing impacts;

6.2.4.6.1.6. Determination of the project financing requirements and evaluation of alternative financing structures and sources;

6.2.4.6.1.7. Evaluation of alternative procurement options and PPP options, including value for money analysis; and

6.2.4.6.1.8. Sensitivity analysis to determine the impact of changes in some key variables on all critical output parameters.

6.2.4.6.2. **PPP Project Structure**

6.2.4.6.2.1. Detailed description of the type of PPP project proposed;

6.2.4.6.2.2. Anticipated roles and key responsibilities of the private sector and the CA;

6.2.4.6.2.3. Construction, and operational efficiencies that may realistically be expected of the private sector;

6.2.4.6.2.4. A summary of the output specifications for the project;

6.2.4.6.2.5. Other potential services that may be provided or commercial activities (ToD) that may be undertaken by the private partner and not included in the initial project description;

6.2.4.6.2.6. Allocation of key risks;

6.2.4.6.2.7. Outline payment mechanism;

6.2.4.6.2.8. Indicative financing structure (appropriate equity returns, debt service cover ratio and costs of debt etc.);

This data should be identified and used as the basis for costing. All assumptions should be clearly stated.

6.2.4.6.3. **Comparative Risk Matrix**

Design a comparative risk matrix that qualifies the liabilities associated with the recommended project configuration, and proposes how each of the risks should be anticipated, methods of mitigating the risk and recommendation on the proper allocation of the risk. This information shall be of interest to the CA in its review of the fiscal risk commitments and contingent liabilities assumed in the proposed project structure. At a minimum, the comparative risk matrix shall contain the following information:

6.2.4.6.3.1. Risk and its description;

6.2.4.6.3.2. Expert's estimate of the probability that the risk will materialize, together with the rationale/assumption;

6.2.4.6.3.3. Expert's estimate of the impact of the risk as a percentage of the base;

6.2.4.6.3.4. The base or amount;

6.2.4.6.3.5. Most likely timing of the risk event;

6.2.4.6.3.6. Cost of the risk in NPV terms;

6.2.4.6.3.7. Risk distribution between public and private parties in terms of percentage of costs borne;

6.2.4.6.3.8. Distribution of the cost of the risk between parties in terms of NPV amount; and

6.2.4.6.3.9. Mitigation of risk.

6.2.4.6.4. **Value- for - Money and Affordability Analysis**

The affordability analysis should also include an expected range of revenue(fees) to be collected by the CA from the private sector provider for its budget, if applicable. In case the project doesn't seem financially feasible, the analysis should include an estimate of the quantum of public funding that would be required to attract private sector participation and also access the economic justification for the CA to contribute such funding.

6.2.4.7. **Environmental and Social Impact Assessment (ESIA)**

6.2.4.7.1. Conduct Environmental Impact Assessments (EIA) for each project corridor (air quality, noise, biodiversity, landscape, forests).

6.2.4.7.2. Conduct Social Impact Assessments (SIA) including land acquisition, resettlement, impact vulnerable communities (or any other communities like indigenous groups), gender impacts.

6.2.4.7.3. Analyze potential use phase environmental impact like vibration, echo, noise. Recommend mitigation measures.

6.2.4.7.4. Develop Environmental and Social Management Plans (ESMPs).

6.2.4.7.5. Identify climate resilience and disaster risk management measures.

6.2.4.8. **Risk assessment and mitigation plan**

6.2.4.8.1. Conduct detailed risk assessment, risk categorization and formulation of a risk register (technical, operational, financial, environmental, social).

6.2.4.8.2. Assess, quantify the project for potential natural hazards like wind load, earthquake, ice/snow, lightning. Estimate mitigation measures and cost.

6.2.4.8.3. Prepare a risk matrix with mitigation strategies and risk allocation under PPP scenarios.

6.2.4.9. **Project Implementation Plan**

6.2.4.9.1. Prepare a detailed project implementation schedule (pre-construction, procurement, construction, commissioning).

6.2.4.9.2. Identify key procurement requirements and potential packaging of contracts.

6.2.4.9.3. Estimate construction period and sequencing.

6.2.4.9.4. Pre-opening safety analysis (to determine if additional safety measures are needed) and pre-operations test of the rope. Suggest pre-opening tests (defectograph or other non-destructive testing system which can locate defects in the wires).

6.2.4.9.5. Develop financing plan options (public, PPP, blended)

6.2.4.10. **Operations**

6.2.4.10.1. Minimum operating team composition, staff qualifications and responsibilities.

6.2.4.10.2. Draft operations plan including staff shifting and rotation plan.

6.3. Aerial Ropeway FS Key Deliverables

The consultant shall refer to the sub-deliverables outlined in Section 14.7 and ensure their integration into the appropriate format as specified in Section 14.4. It is essential that each sub-deliverable is prepared in accordance with the respective scope, methodology, and other requirements relevant to each transport mode.

7. MULTIMODAL TRANSPORT AND TRADE LOGISTICS MASTER PLAN

Following the development of the Railway Master Plan that examines enhancing Bhutan's transport network by the inclusion of a railway system and infrastructure, Aerial Ropeway Feasibility Study and the IWT Feasibility Study where their primary objective is to assess the technical, economic, environmental, and social feasibility for their introduction in Bhutan, the consultant is required to develop a comprehensive multimodal transport and trade logistics master plan for Bhutan, that

incorporates all modes of transport including the integration of road and air with rail, aerial ropeways and waterways. Refer also to Section 3 Trade Facilitation Assessment for an overview of Bhutan's trade facilitation performance, including inter-agency coordination, customs, Non-Tariff Measures (NTMs), and trade-enabling infrastructure, that provide information that can feed into the multimodal transport and trade logistics master plan.

7.1. Scope of Work - Multimodal Transport and Trade Logistics Master Plan

The Scope of Work for the Comprehensive Multimodal Transport and Trade Logistics Master Plan shall include at least the following issues:

7.1.1. Review and analyse the findings of the Railway Master Plan.

7.1.2. Assess the feasibility study for aerial ropeway and inland waterway transport development.

7.1.3. Identify key transport and trade corridors within Bhutan and their connections to regional partners like India, Bangladesh, and Nepal. The assessment and determination of key trade corridors shall take into account all modes of transport (road/rail/aerial ropeways/waterways/air) and their integration and dependence on each other, if any. Note: An identified key trade corridor does not necessarily need to apply all modes of transport in its operation.

7.1.4. Evaluate current infrastructure, logistics, and trade practices, and identify gaps and opportunities. This shall require the evaluation of current infrastructure, logistics, and trade practices, and the identification of gaps and opportunities. The following shall be taken into account and reviewed and analysed, as a minimum:

7.1.4.1. Current Infrastructure Assessment

7.1.4.1.1. Conduct a comprehensive inventory of the existing transport infrastructure, including roads, railways, ports, aerial ropeways and inland waterways. Evaluate the condition, capacity, and utilization of these facilities.

7.1.4.1.2. Assess the operational efficiency of current transport networks and identify bottlenecks that impede the smooth flow of goods and services.

7.1.4.1.3. Review maintenance practices and programs to determine their adequacy in sustaining infrastructure quality and reliability.

7.1.4.2. Logistics Systems Evaluation:

7.1.4.2.1. Map out existing supply chain routes and logistics hubs. Analyze the logistics networks for efficiency, cost-effectiveness, and reliability.

7.1.4.2.2. Evaluate the usage of technology in logistics operations, including tracking systems, inventory management, and customs processes.

7.1.4.2.3. Assess how current regulations impact logistics efficiency and propose potential reforms to improve trade facilitation.

7.1.4.3. Trade Practices Review:

7.1.4.3.1. Examine trade volumes, major commodities, and trade patterns to understand demand and supply dynamics.

7.1.4.3.2. Analyse cross-border trade processes, including customs clearance and border checks, to identify opportunities to minimize inefficiencies or hurdles.

7.1.4.3.3. Evaluate existing trade agreements and partnerships with neighboring countries and their impact on trade flow.

7.1.4.4. Gap Identification:

7.1.4.4.1. Infrastructure Gaps - Identify areas where infrastructure is lacking or inadequate to meet current and future demands. This may include missing links in transport networks or insufficient capacity.

7.1.4.4.2. Service Level Gaps - Identify where less than efficient service levels exist, such as slow transit times, high costs, or unreliability.

7.1.4.4.3. Policy and Regulatory Gaps - Highlight where gaps in policy or regulations may be impeding efficient logistics and trade, such as restrictive customs procedures or lack of standardization.

7.1.4.5. Opportunities for Improvement:

7.1.4.5.1. Propose opportunities for new infrastructure development or upgrades to support emerging trade corridors, and include robust cost estimates with confidence levels well defined, and cost-benefit analysis.

7.1.4.5.2. Suggest improvements in logistics practices, for example, adopting advanced technologies for better inventory management, and consider implementing 'green logistics' practices such as:

7.1.4.5.2.1. Road transport using fuel-efficient or electric vehicles, optimizing routes to reduce fuel consumption, and implementing eco-driving techniques.

7.1.4.5.2.2. Railway used by shifting freight from road to rail, as trains produce lower emissions per ton-mile compared to trucks, and investing in energy-efficient locomotives.

7.1.4.5.2.3. Waterways utilization to reduce reliance on high-emission road transport, and adopting cleaner fuels for boats and ships.

7.1.4.5.2.4. Aerial ropeways by shifting transport from roads to electric cable systems, powered by renewables, with energy-efficient cabins and optimized operations to cut emissions.

7.1.4.5.2.5. Air transport using sustainable aviation fuels, improving aircraft efficiency, and optimizing flight routes to minimize fuel consumption.

7.1.4.5.3. Recommend policy and regulatory reforms to enhance trade facilitation and reduce administrative burdens.

7.1.4.5.4. Identify opportunities for collaboration among stakeholders, including Public-Private Partnerships to leverage resources and expertise for transport and trade enhancement.

7.1.4.5.5. Define strategies for integrating various modes of transport (rail, road, inland waterways) into a cohesive network.

7.1.5. Stakeholder engagement is an important aspect to gather insights and ensure alignment with national and regional development goals. This shall be addressed in the consultant's stakeholder engagement strategy document, and enacted as proposed.

7.1.6. Comprehensive data collection and analysis is required to ensure the robustness of the Master Plan. As a minimum, data collection and analysis shall include transport demand forecasts, economic evaluations, and environmental impact assessments.

7.1.7. Developing the Master Plan

As part of the development of the comprehensive multimodal transport and trade logistics master plan, the consultant is expected to undertake a strategic and thorough approach to ensure that Bhutan's transport infrastructure is capable of supporting future economic growth and regional integration.

In the development of the Master Plan the consultant must formulate actionable recommendations and robust estimates with confidence levels well defined, for infrastructure development and policy frameworks. This involves identifying critical infrastructure needs, estimating the costs of the infrastructure needs, and proposing strategic initiatives to build or upgrade transport networks. These recommendations should be grounded in the findings from the techno-financial feasibility assessments and aligned with Bhutan's national development objectives.

Based on the information and data sourced and determined by the consultant, the consultant shall prepare an efficient freight Logistics Landscape of Bhutan, in both digital and 3D models and project public and private investment opportunities (in USD), and potential Public Private Partnerships (PPPs).

In addition, the plan should include a phased implementation strategy. This requires the consultant to prioritize critical infrastructure projects (with cost estimates) and policy changes that will deliver the greatest immediate benefits, demonstrated through robust cost-benefit analysis. The consultant should outline a clear timeline and designate phases that consider resource availability, potential impact, and strategic importance to ensure these projects are initiated without delay.

Further, the consultant is instructed to identify and prioritize regulatory reforms that will enhance transport logistics efficiency. This involves reviewing existing regulations and policies to highlight

any barriers to rapid and cost-effective transport operations. Recommendations should aim at streamlining procedures, enhancing inter-agency coordination, and reducing bureaucratic hurdles.

Another crucial aspect is addressing cross-border issues in coordination with regional trade partners. The consultant should work on identifying existing bottlenecks and suggest mechanisms to facilitate smoother trading processes with neighboring countries such as India, Bangladesh, and Nepal. This may involve harmonizing customs procedures, improve transport linkages, and establish shared logistics hubs.

Furthermore, incorporating best practices and innovative solutions is essential for developing a robust and sustainable transport system. The consultant is expected to research global and regional case studies to identify successful practices that promote efficiency, sustainability, and resilience in transport development. Technologies and solutions that can minimize environmental impact and enhance adaptive capacity should be prioritized.

In summary, the consultant is required to address the following key tasks in developing the Master Plan:

7.1.7.1. Formulate recommendations for infrastructure development and policy frameworks.

7.1.7.2. Design a phased implementation strategy, prioritizing critical projects for immediate attention.

7.1.7.3. Identify and prioritize the regulatory reforms needed to improve transport logistics.

7.1.7.4. Identify and prioritize cross-border issues that need to be addressed with regional trade partners.

7.1.7.5. Identify best practices and innovative solutions for efficient and sustainable transport development.

By focusing on these areas, the master plan will provide a comprehensive roadmap for advancing Bhutan's transport and trade infrastructure, driving economic growth and enhancing regional connectivity.

7.2. Master Plan Deliverables

7.2.1. The consultant shall prepare the Master Plan which shall consist of findings from the three different modes of transport (ref. Section 14.5, 14.6, & 14.7) and integrate it with trade logistics to provide a clear actionable recommendation along with implementation plan and cost estimate as given in Section 14.4. Further, as given in Section 14.2, the technical details shall be relegated to appropriate addendum volumes.

7.2.2. Presentations and workshops for MoIT and other stakeholders.

8. SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT (SEIA)

So that the SEIA is demonstrated to align with Bhutan's development philosophy and the Gross National Happiness (GNH) framework, the consultant shall introduce the significance of developing comprehensive transport and trade logistics networks through waterways, aerial ropeways and rail connections in Bhutan in alignment with the GNH framework. The significance of the development shall clearly demonstrate that the SEIA aligns with Bhutan's unique development philosophy centered around the GNH framework, which requires balancing economic growth with cultural preservation, environmental sustainability, and social well-being.

8.1. **SEIA Objectives:**

8.1.1. Conduct a detailed assessment of potential social and environmental impacts in line with GNH principles.

8.1.2. Develop strategies to mitigate adverse impacts and promote sustainable and inclusive development.

8.2. **SEIA Scope of Work:**

8.2.1. The consultant shall undertake the Social and Environmental Impact Assessment made up of two distinct activities as set out below. Deliverables and reports shall be as set out in the section below

8.2.2. **Environmental Impact Assessment:**

8.2.2.1. The consultant shall evaluate impacts on biodiversity, ecosystems, and natural landscapes, ensuring protection of significant environmental assets, and assess the implications for air quality, water bodies, and soil, in adherence to environmental sustainability goals.

8.2.2.2. The consultant shall investigate and report in the risk management report, any potential risks associated with climate change and propose adaptive measures.

8.2.3. **Social Impact Assessment:**

8.2.3.1. The consultant shall undertake the following social impact assessment activities:

8.2.3.1.1. Examine the effects on communities, including impacts on local livelihoods, cultural heritage, and demographic changes.

8.2.3.1.2. Assess potential displacement and propose measured strategies for equitable resettlement and livelihoods restoration.

8.2.3.1.3. Evaluate the project's alignment with community values and traditional practices, respecting Indigenous Peoples and culturally significant sites.

8.3. **SEIA Alignment with GNH Framework:**

8.3.1. The consultant shall ensure the assessment incorporates the four pillars of GNH being:

8.3.1.1. Sustainable and equitable economic development,

8.3.1.2. Conservation of the environment,

8.3.1.3. Preservation, and

8.3.1.4. Promotion of culture, and good governance.

8.4. **SEIA Legal and Regulatory Framework:**

8.4.1. Review Bhutanese laws and regulations, emphasizing those that align with GNH and international standards for social and environmental safeguards.

8.5. **SEIA Methodology:**

8.5.1. The consultant shall prepare a methodology for no-objection approval by the MoIT of the detail data collection methods, emphasizing participatory approaches and stakeholder engagement consistent with GNH values. The methodology shall detail the processes to be followed for regular reporting and effective communication strategies keeping project sponsors and stakeholders updated. Additionally, the methodology shall include baseline data frameworks for social and environmental indicators that align with the nation's development policies.

8.6. **Stakeholder Engagement:**

8.6.1. The consultant shall develop an inclusive stakeholder engagement plan, ensuring broad representation and participation from all community segments, with particular attention to marginalized groups. So as to provide transparency and a history of consultation and feedback, the consultant shall document the consultation processes (incorporating feedback) to refine and record the assessment and project design. (See commentary in 3.2.1 Inception Report)

8.7. **SEIA Deliverables:**

8.7.1. The SEIA deliverable shall not be treated as a separate or standalone activity. Instead, the assessment should be integrated within each transport mode and its associated trade logistics. Depending on the location, scope, and scale of activities under each modal study, the SEIA shall be adapted accordingly to best fit the specific study context.

8.7.2. The consultant shall ensure that the SEIA Report demonstrates that the assessment not only identifies and mitigates potential impacts but also enhances Bhutan's socio-cultural, environmental, and economic well-being, reflecting the spirit of the GNH framework.

8.7.3. The SEIA Report shall be comprehensive whilst reflecting GNH values, with findings, analysis, and recommendations, and clearly communicates findings to stakeholders, with an emphasis on how the project supports GNH. As part of the SEIA assessment, the consultant shall conduct a Happiness Impact Assessment, aligning project outcomes with well-being and life satisfaction metrics. The following shall also be reported as separable items of the SEIA assessment:

8.7.3.1. The Environmental and Social Management Plan (ESMP) shall include pragmatic action plans for impact mitigation considering GNH inputs.

8.7.3.2. Stakeholder Consultation Report shall document all engagement activities and feedback integration that was undertaken for the SEIA assessment.

8.7.3.3. Happiness Impact Assessment Report shall demonstrate that the consultant evaluated and determined the project impacts on happiness and well-being components, and has mitigation plans to manage any negative impact.

8.8. Timeline and Milestones:

8.8.1. The consultant shall define a detailed timeline with key milestones, ensuring the study progresses efficiently and in alignment with overall project scheduling, with SEIA completed in or before month 18.

8.9. Reporting and Communication:

8.9.1. Detail processes for regular reporting and effective communication strategies keeping project sponsors and stakeholders updated.

9. POLICY AND GOVERNANCE REVIEW FOR WATERWAY, AERIAL ROPEWAY & RAILWAY INFRASTRUCTURE DEVELOPMENT

As part of this assignment, the Consultant shall undertake a comprehensive review of the policy, legal, regulatory, and institutional frameworks related to waterway, aerial ropeway and railway infrastructure development in Bhutan, with a particular focus on regional connectivity, multimodal integration, and sustainable development. The Consultant shall ensure compliance with the following requirements:

9.1. Consultant Compliance Requirements

The Consultant shall undertake the following actions:

9.1.1. **Review National Legal and Policy Frameworks**

9.1.1.1. Review and assess existing national laws, regulations, strategies, and policies relevant to inland waterway, aerial ropeway and railway development.

9.1.1.2. Identify any gaps or inconsistencies in the current policy and regulatory framework that could affect project implementation or regional interoperability.

9.1.2. **Alignment with Bhutan's Development Vision and GNH**

9.1.2.1. Ensure alignment with Bhutan's development philosophy, including the Gross National Happiness (GNH) framework and national priorities outlined in the 13th Five-Year Plan, Sustainable Transport Policy, and relevant environmental and social safeguards.

9.1.3. **Assess Institutional Roles and Responsibilities**

9.1.3.1. Review the mandates, functions, and coordination mechanisms of institutions responsible for planning, regulating, and implementing waterway, aerial ropeway and railway infrastructure.

9.1.3.2. Identify overlapping or unclear responsibilities and propose recommendations for streamlined governance and improved inter-agency coordination.

9.1.4. **Ensure Regional and Cross Border Policy Compatibility**

9.1.4.1. Identify international agreements, regional initiatives (e.g., BIMSTEC, BBIN, SAARC), and bilateral MoUs relevant to multimodal connectivity involving waterways, aerial ropeway and railways.

9.1.4.2. Assess Bhutan's legal readiness and policy alignment with regional norms and technical standards required for future integration.

9.2. **Identification of Regulatory Barriers and Opportunities**

9.2.1. The consultant shall identify policy and governance related bottlenecks to private sector participation, financing, and implementation of railway, aerial ropeway and waterway infrastructure, and propose policy reforms or regulatory improvements to enable scalable and bankable investment in multimodal infrastructure.

9.2.2. The consultant shall also identify and list potential private sector opportunities as part of this assessment, as well as potential Public Private Partnership (PPP) opportunities where Bhutan Government and Private Sector can team to provide mutually acceptable economic and financial outcomes.

9.3. **Compliance with World Bank and International Best Practice**

9.3.1. The consultant shall ensure all policy assessments and recommendations adhere to World Bank guidelines and good practice standards, including on environmental and social sustainability, PPP governance, institutional strengthening, and regional integration.

9.4. **Incorporation of Gender and Social Inclusion (GESI) Perspectives**

9.4.1. The consultant shall analyze how policy and governance frameworks account for gender equality, accessibility, and the inclusion of vulnerable populations, and propose compliance measures or policy enhancements to address identified gaps.

9.5. **Facilitation of Stakeholder Consultations**

9.5.1. In the course of the assignment, the consultant shall engage with relevant government bodies (e.g., Ministry of Infrastructure and Transport, Department of Surface Transport, Bhutan Construction and Transport Authority), private sector actors, and civil society as required during the policy review process.

9.5.2. Stakeholder inputs shall be integrated into the governance diagnostic and reform recommendations, with clarity so that all stakeholders can identify that their needs and requirements have been included.

9.6. **Actionable Policy Recommendations**

9.6.1. The consultant shall deliver actionable policy recommendations and provide clearly prioritized, evidence-based, and implementable policy and institutional recommendations to enhance waterway, aerial ropeway and railway sector governance. Where applicable, the consultant shall propose draft amendments or revisions for consideration by the MoIT.

9.7. **Document Transparency - All Sources and with a Policy Matrix**

9.7.1. So as to provide transparency in approach and actions, the consultant shall include a comprehensive Policy and Legal Review Matrix summarizing each reviewed instrument, its relevance, gaps, and proposed action, with reference to all applicable laws, regulations, and policy documents in the annexes.

9.7.2. Here is an example of the Policy Matrix for consideration:

Policy/Legal Aspect	Current Framework/ Status	Responsible Institutions	Key Issues/Challenges	Recommendations for Improvement
Policy on Waterway Development	National water transport policy established in 2010	Ministry of Infrastructure and Transport	Limited scope and outdated policy measures	Update policy to include sustainable practices and technological advancements
Railway Infrastructure Regulations	Railway Act of 2015	Bhutan Railroad Authority	Lack of enforcement mechanisms	Strengthen legal framework and enforcement capacity
Environmental Regulations for Transport	Environmental Protection Act 2007	National Environment Commission	Inadequate integration with transport policies	Harmonize environmental regulations with transport planning
Cross-border Trade Facilitation Policies	Trade Facilitation Agreement 2018	Department of Trade	Bureaucratic customs procedures	Simplify and automate customs procedures
Investment in Transport Infrastructure	Public-Private Partnership Law 2016	Ministry of Economic Affairs	Insufficient incentives for private sector investment	Develop more attractive investment incentives
Safety Standards and Compliance	Transport Safety Regulations 2010	Bhutan Standards Bureau	Outdated safety standards	Revise standards to align with international best practices

Table 2. Example of Policy Matrix

10. RISK MANAGEMENT REQUIREMENTS

The Consultant shall implement a structured, transparent, and responsive Risk Management Framework throughout the duration of the assignment, in alignment with:

a) International best practices (e.g., ISO 31000),

b) The World Bank's Environmental and Social Framework (ESF), and other applicable risk management requirements under the World Bank Procurement Regulations, and

c) Bhutan's national development priorities, particularly the principles of Gross National Happiness (GNH).

10.1. Risk Management Framework

10.1.1. The Consultant shall develop and apply a risk management framework that systematically identifies and assesses risks across technical, institutional, financial, environmental, social, and political dimensions. The risk management framework shall:

10.1.1.1. Prioritize risks using a likelihood impact matrix and assigns responsibility for mitigation.

10.1.1.2. Ensure proactive and iterative risk mitigation planning and monitoring.

10.1.1.3. Align with relevant risk management obligations outlined in the project's World Bank financed documents (e.g., Project Appraisal Document, Environmental and Social Commitment Plan (ESCP), and relevant safeguards instruments).

10.2. Risk Register

10.2.1. The Consultant shall prepare and maintain a Risk Register starting from project inception. The Risk Register shall list all identified risks with clear categorization (e.g., technical, stakeholder, institutional, environmental, GNH-related, financial). The risk register shall include at least the following fields:

10.2.1.1. Risk ID and description
10.2.1.2. Category and type of risk
10.2.1.3. Probability and impact (scored qualitatively or quantitatively)
10.2.1.4. Overall risk rating (e.g., Low, Medium, High)
10.2.1.5. Risk owner
10.2.1.6. Mitigation and contingency actions
10.2.1.7. Timeframe for review and action
10.2.1.8. Status/update notes

10.2.2. The risk register shall be updated monthly, and any newly identified or elevated risks shall be communicated promptly to the Ministry of Infrastructure and Transport (MoIT) and submitted as an annex to monthly progress reports.

Risk ID	Risk Description	Category	Likelihood	Impact	Risk Rating (L/M/H)	Mitigation Measures	Risk Owner	Time-frame	Status/ Comments
R01	Delay in stakeholder consultation	Institutional	Medium	High	High	Early engagement and clear	Consultant Team Lead	Q1-Q2	Pending confirmation from MoIT

						schedule plan			

fTable 3. Example of Risk Register Template

10.3. **Monthly Risk Reports**

10.3.1. The Consultant shall prepare a dedicated Monthly Risk Report as an annex to the Monthly Progress Report as mentioned in reporting requirements. The monthly risk report shall include at least the following aspects:

10.3.1.1. A narrative summary of the current risk landscape and any changes since the previous report.

10.3.1.2. An updated version of the Risk Register with highlights of newly identified risks or significant updates.

10.3.1.3. Analysis of trends, emerging risks, or persistent high-risk areas.

10.3.1.4. Actions taken and recommendations for MoIT or stakeholder intervention where required.

10.3.1.5. Compliance updates related to risk management obligations under the World Bank's ESF and Procurement Regulations.

10.4. **Integration of Gross National Happiness (GNH) in Risk Management**

10.4.1. Given Bhutan's commitment to GNH as a guiding development framework, the Consultant shall evaluate risks not only for financial and technical impact but also for their potential implications on:

10.4.1.1. Sustainable and equitable socio-economic development – Ensuring balanced economic growth that benefits all citizens.

10.4.1.2. Environmental conservation – Protecting Bhutan's rich biodiversity and maintaining ecological sustainability.

10.4.1.3. Preservation and promotion of culture – Safeguarding Bhutanese traditions, language, and values.

10.4.1.4. Good governance – Strengthening institutions and policies to support happiness and well-being.

10.4.2. Risk Management shall incorporate GNH-aligned mitigation measures into the risk response strategy, prioritizing:

10.4.2.1. Avoidance of environmentally and culturally sensitive disruptions

10.4.2.2. Promotion of inclusive and participatory processes

10.4.2.3. Equitable distribution of study benefits and data access

10.4.3. The risk management process shall use national tools or guidance (e.g., GNH screening checklists, where available) to assess alignment with GNH values, and report on GNH-related risks and mitigations in the Monthly Risk Report under a dedicated section.

10.5. **World Bank Risk Management Compliance**

10.5.1. To meet World Bank expectations, the Consultant shall be familiar with the World Bank Environmental and Social Framework (ESF), particularly in relation to risk and impact management, and consider risks relevant to World Bank-financed activities, including reputational risks, non-compliance with social and environmental safeguards, and delayed implementation due to procurement or institutional bottlenecks. The consultant shall also:

10.5.1.1. Support MoIT and other stakeholders in tracking and managing any risks or mitigation commitments outlined in the project's ESCP or other loan/grant documentation.

10.5.1.2. Flag risks that may affect the project's performance rating or timely implementation, particularly those that could trigger World Bank remedies under the Financing Agreement.

10.5.1.3. Participate in World Bank-led supervision missions, reviews, and evaluations of risk mitigation progress as required.

11. INTEGRATION AND ALIGNMENT WITH GROSS NATIONAL HAPPINESS (GNH) PILLARS:

11.1. In developing key deliverables for the ACCESS Project, the study consultant shall focus on ensuring integration and alignment with the Gross National Happiness (GNH) pillars, in alignment with Bhutan's development philosophy. The consultant will evaluate how the proposed transport and trade initiatives align with GNH's core principles, including sustainable development, environmental conservation, cultural preservation, and good governance.

11.2. The consultant shall conduct a sustainability impact analysis, which scrutinizes the environmental footprint of the project, to ensure that all efforts are made to conserve natural resources, protect biodiversity, and implement sustainable practices that minimize ecological harm. Simultaneously, a socio-cultural impact assessment shall be undertaken to understand the project's implications for local cultures and traditions. This component respects and promotes Bhutanese cultural values, ensuring that the project's developments enrich rather than erode cultural heritage.

11.3. As part of the required Report on public, private, and PPP investment opportunities report, the consultant will demonstrate how the project can facilitate equitable economic growth, ensuring that local communities and marginalized groups benefit from economic opportunities. This document shall emphasize inclusive growth and the fair distribution of the positive impacts generated by the project.

11.4. In line with the good governance pillar, the Governance and Institutional Framework Report deliverable shall offer recommendations for transparent and accountable governance structures. These structures are designed to be inclusive, ensuring consultation and broad participation of stakeholders and reflecting the values of good governance throughout project execution.

11.5. Realizing the importance of engaging all sectors of society, the consultant is required to prepare and implement a stakeholder engagement strategy, as mentioned in the Inception Report. This strategy shall ensure that various stakeholders, including local communities, are actively involved in decision-making processes. Their inputs and concerns are integrated into planning and implementation phases, reflecting a community-centric approach.

11.6. The consultant shall develop well-being and quality of life metrics to provide specific indicators to measure the impact of initiatives on the happiness and well-being of Bhutan's citizens, and include these results in the Monthly Progress Report. These metrics shall align with GNH criteria, facilitating a holistic assessment of project outcomes beyond traditional economic indicators.

11.7. The risk mitigation plan developed shall also identify socio-economic and environmental risks. This plan shall articulate strategies to mitigate these risks, maintaining the project's resilience and sustainability aligned with GNH principles.

11.8. As part of creating culturally aware initiatives, the project shall also include cultural sensitivity training of all project staff to ensure that project teams understand and respect local cultural nuances.

11.9. The Monthly Progress Report shall also have a section titled "Monitoring and Evaluation Framework" for continuous assessment and reporting of the project's adherence to GNH principles. This framework shall allow for necessary adjustments and interventions throughout the project lifecycle, ensuring sustained alignment with Bhutan's unique development philosophy.

11.10. It is essential that the ACCESS Project deliverables not only enhance trade and transport connectivity but does so in a manner that is harmonious with the Gross National Happiness vision, thus supporting holistic national development in Bhutan.

12. REPORTS

12.1. Inception Report

12.2. 1st Interim Report

12.3. 2nd Interim Report

12.4. 3rd Interim Report

12.5. Draft Final Report

12.6. Final Report

12.7. Monthly Progress Reports

13. DURATION OF ASSIGNMENT

The Consultant will carry out the activities listed in the form of Lump Sum contract over a period of eighteen (18) months from the award of the contract. The expected commencement date for the services is May 2026.

14. DELIVERABLES AND DEADLINE

Important Instructions to Consultants

14.1. Integration of Sub-deliverables

The consultant will propose to integrate sub-deliverables into the main deliverables (Reports 1–6) as appropriate, depending on the study's progression and findings. However, all sub-deliverables must be fully incorporated into the main deliverables and completed within the specified timelines. In other words, none of the sub-deliveries can be left out, but the consultant can propose the sequence of sub-delivery submission through the six reports. The sub-delivery submission schedule will be proposed by the consultant during the RFP stage, and will be finalized by the consultant through the inception report.

14.2. Report Format Requirement

Submission Format: All reports must be submitted in both hard copy and digital formats (PDF and editable Word/Excel files where applicable).

14.2.1. Reports 1-4 (Inception through 3rd Interim Report, as shown in Table 4): Submit as a SINGLE consolidated report with appropriate sections/chapters covering all transport modes and trade logistics.

14.2.2. Draft Final Report onwards (Reports 5-6): Submit as four separate physical volumes:

14.2.2.1. Volume I - Main Report: Executive summary, key findings, recommendations, implementation strategies, and integrated multi-modal transport and trade logistics masterplan (intended for decision-makers and policymakers)

14.2.2.2. Volume II - Annexure: Railway Technical Report: Detailed technical analysis, working sheets, calculations, and all railway-specific data

14.2.2.3. Volume III - Annexure: IWT Technical Report: Detailed technical analysis, working sheets, calculations, and all IWT-specific data

14.2.2.4. Volume IV - Annexure: Aerial Ropeway Technical Report: Detailed technical analysis, working sheets, calculations, and all aerial ropeway-specific data.

14.3. **Submission Format**

All reports must be submitted in both hard copy and digital formats (PDF and editable Word/Excel files where applicable).

14.4. **Main Deliverables**

Report no.	**Deliverables**	**Description**	**Deadline (months, after signing of contract)**
1	Inception report	Prepare a comprehensive inception report covering all three transport modes (Railway, IWT, and Aerial Ropeway). The report shall include: i. Study objectives, scope, and methodology for each transport mode ii. Detailed work plan with timelines and milestones iii. Initial findings and preliminary assessments iv. Stakeholder Engagement Strategy: Comprehensive plan outlining stakeholder categories (government agencies, private sector, local communities, regional partners), consultation methodology, timeline, and feedback integration mechanism v. Integration Framework: Dedicated section explaining the methodology for integrating findings from each transport mode with trade and logistics analysis for the development of the Multi-modal Transport and Trade Logistics Masterplan	1

		vi. Data collection plan and baseline information requirements Note: This report must incorporate all mode-specific inception report requirements as specified in the sub-deliverables section.	
2	1st Interim report	Submit a consolidated report covering all three transport modes as follows. a. Supply Chain and Logistics Analysis i. Identification and analysis of priority supply chains ii. Mapping of production clusters and consumption centers iii. Growth projections for key commodities/sectors till 2055 iv. Logistics infrastructure requirements assessment based on projected demand v. Analysis of existing trade flows and trade facilitation requirements b. Review of Existing Plans i. Comprehensive review of existing masterplans, expansion plans, and feasibility studies for all transport modes ii. Assessment of proposed industrial zones, dry ports, and logistics infrastructure iii. Regional connectivity priorities and cross-border trade considerations iv. Gap analysis and recommendations for rationalization and integration c. Stakeholder Consultation Outcomes i. Summary of stakeholder consultations conducted as per the engagement strategy ii. Key issues, concerns, and suggestions raised by stakeholders iii. Analysis of stakeholder feedback and its integration into the study. d. Sub-deliverables of the Railway, IWT, and Aerial Ropeway components as proposed by the consultant in RFP and later confirmed by the inception report.	4
3	2nd Interim report	Submit a comprehensive report containing: i. Detailed technical analysis and recommendations for each transport mode ii. Cost Estimates: Detailed capital expenditure (CAPEX)	9

		and operational expenditure (OPEX) for all proposed projects across all modes iii. Financial Analysis: Revenue projections, financing mechanisms, affordability analysis, and fiscal impact assessment iv. Economic Analysis: Cost-benefit analysis, economic rate of return (ERR), net present value (NPV), economic impact assessment including employment generation and GDP contribution v. Implementation Strategies: Phased development plans, project prioritization based on urgency, economic viability, and strategic importance vi. Risk Assessment: Identification of technical, financial, environmental, and social risks with mitigation measures vii. Concise executive summary highlighting key recommendations Note: Consultant should integrate relevant mode-specific draft reports and analyses into this consolidated report.	
4	3rd Interim report	Submit an integrated report that synthesizes findings from all transport modes with trade and logistics analysis. a. Multi-modal Integration i. Integration framework showing how different transport modes complement each other ii. Identification of intermodal connectivity points and transfer facilities iii. Multi-modal corridor development recommendations iv. Last-mile connectivity solutions b. Freight Flow Modeling i. Comprehensive freight flow modeling results for all transport modes ii. Origin-destination matrices for key commodities iii. Modal share analysis and projections iv. Traffic forecasting for short-term (5 years), medium-term (15 years), and long-term (30 years) v. Sensitivity analysis under different economic scenarios c. Trade and Logistics Integration i. Trade facilitation measures and border	12

		infrastructure requirements ii. Logistics services development strategy iii. Regional connectivity and transit trade opportunities iv. Digital infrastructure and ICT requirements for integrated logistics management d. Sub-deliverables of the Railway, IWT, and Aerial Ropeway components as proposed by the consultant in RFP and later confirmed by the inception report.	
5	Draft final report	Submit four separate volumes as follows: **Volume I - Main Report** (For decision-makers and policymakers): i. Executive Summary ii. Integrated Multi-modal Transport and Trade Logistics Masterplan iii. Key findings and recommendations (consolidated across all modes) iv. Prioritized project portfolio with justification v. Implementation roadmap and monitoring framework vi. Summary of financial and economic analyses vii. Policy recommendations viii. Detailed action plan for implementation with timelines and budget estimates. **Volume II - Annexure: Railway Technical Report** **Volume III - Annexure: IWT Technical Report** **Volume IV - Annexure: Aerial Ropeway Technical Report** Each annexure volume must contain: ix. Detailed technical analysis and design parameters x. All calculations, working sheets, and technical data xi. Detailed survey and investigation results xii. Detailed cost estimates and BOQs xiii. Detailed financial and economic analysis xiv. Environmental and social impact assessments xv. All maps, drawings, and technical specifications Additional Reports (integrated within appropriate volumes): xvi. Governance and Institutional Framework Report: Organizational structures, institutional capacities, regulatory frameworks, and capacity building	15

		requirements xvii. Public, Private, and PPP Investment Opportunities Report: PPP structuring options, risk allocation, regulatory requirements, and investor attraction strategies xviii. Social and Environmental Impact Assessment (SEIA): Comprehensive environmental and social assessment covering cumulative impacts across all modes Note: All mode-specific final reports and feasibility studies must be completed and incorporated into their respective annexure volumes.	
6	Final report	Submit the final version of all four volumes incorporating: i. All comments and feedback from stakeholders and the client ii. Validation of technical, financial, and economic analyses iii. Refined recommendations and implementation strategies iv. Updated cost estimates (if required) v. Final maps, drawings, and technical documentation The Final Report must be comprehensive, publication-ready, and suitable for: i. Government decision-making and policy formulation ii. Presentation to development partners and potential investors iii. Public dissemination iv. Implementation by relevant agencies	17
Activity	Capacity Building Programs on Railway, aerial ropeway and IWT	Design and conduct capacity building programs for government officials and relevant stakeholders on: i. Railway planning, operations, and maintenance ii. Inland Water Transport (IWT) operations and management iii. Aerial ropeway technology, safety standards, and operations iv. Multi-modal transport planning and logistics management v. Knowledge transfer on the model developed by the consultants during the preparation of the Multimodal Transport study.	continuous

		Requirements: i. Develop training modules and materials for each topic ii. Conduct training for a minimum of 10 officials in each section. iii. Provide training in both English and Dzongkha iv. Submit training reports with participant feedback and assessment	
Presentations	Audio Visual presentation of Study findings and recommendations (in both English and Dzongkha)	Prepare professional audio-visual presentations summarizing: i. Study methodology and approach ii. Key findings for each transport mode iii. Integrated multi-modal masterplan recommendations iv. Implementation strategy and expected outcomes v. Economic and social benefits Requirements: i. Create presentations in both English and Dzongkha ii. Suitable for presentation to Cabinet, Parliament, and public forums iii. Include infographics, maps, charts, and animations for easy comprehension iv. Provide both full presentation and short summary versions	To be proposed by the consultant
9	Monthly Progress Reports	Submit monthly progress reports throughout the contract period covering: i. Activities completed during the month ii. Progress against work plan and milestones iii. Issues encountered and resolution strategies iv. Stakeholder consultations conducted v. Plan for the next month vi. Financial progress (expenditure against budget) Format: Brief report (5-10 pages) with progress charts and photographs of field activities	Last week of every month other than month 1 and the last month of the contract duration

Table 4. Main Deliverables

The consultant has the flexibility to integrate these sub-deliverables into the main deliverables (Reports 1–6) as appropriate, based on the study's logical progression and findings. However, all sub-deliverable requirements must be incorporated into the main deliverables and completed within their specified timelines.

14.5. **Sub-deliverables for Railway**

i.	Draft report including technical, costs and financial details including economic, and environmental analyses.
ii.	Technical details, phased implementation strategy, prioritized projects based on cost-benefit analysis, costing of all proposals including cost-benefit analysis for all the investment proposals over a period of at least the initial 25 years, and a funding plan for the recommended projects.
iii.	Providing a concise summary of key findings and recommendations suitable for policymakers.

Table 5. Sub-deliverables for Railway

14.6. **Sub-deliverables for IWT**

i.	Determine if the river has sufficient discharge, suitable gradient and morphology for developing it into a waterway. It shall also include a detailed hydrographic survey to assess the navigability of the waterway, height of structures across the river and strength of current.
ii.	Draft report including technical, costs and financial details including economic, and environmental analyses.
iii.	Recommendations, costings, financial and economic analysis, and implementation strategies, with a concise executive summary

Table 6. Sub-deliverables for IWT

14.7. **Sub-deliverables for Aerial Ropeways**

i.	Identify list of projects and corridor level analysis
ii.	Prepare regulations, implementation roadmap, and procedural documents for safe, sustainable, and scalable aerial ropeway transport in Bhutan.
iii.	Detailed design, feasibility and project concept report (for the 3 most feasible aerial ropeways project identified).
iv.	A comprehensive report covering all the identified tasks in detail.

Table 7. Sub-deliverables for Aerial Ropeways

The deadlines indicated assume that the MoIT and its partners complete deliverable reviews and/or approvals within 21 days of receipt; however, payments will be made according to the agreed schedule and are not contingent on the completion or approval of deliverables. Monthly Progress Reports (MPRs) shall be submitted no later than 7 calendar days after the end of each month and shall summarize progress towards key items in the scope and challenges experienced. The Consultant shall

also schedule monthly meetings with the MoIT and assigned WB team to present MPR findings and provide both parties with the opportunity to request clarifications, etc.

15. STAFFING REQUIREMENTS

To achieve the objectives of consultant services under this Terms of Reference and in accordance with the scope of works as stated, the requirement of following professional and staff with anticipated person months has been estimated.

The Consultant is free to propose an appropriate team composition for the study, but it is likely to require a mix of international and local Consultants with substantial international and developing country experience in strategic transport studies, and having expertise and experience in taking up home interview surveys and preparing Transport Plans through travel demand modeling techniques for the cities of similar magnitude, including:

a) Transportation Planning
b) Trade competitiveness and supply chain efficiency
c) Transport Demand Modeling
d) Highway/ Road Engineering
e) Traffic Engineering/Planning
f) Public transport services planning and operations;
g) Statistics / System Analysis
h) Transport economics, economic appraisal and financial analysis;
i) Trade and transport facilitation and integrated border management;
j) Inland water transport;
k) Aerial Ropeways
l) Railways, freight and logistics services infrastructure
m) Air express industry and
n) Public-Private Partnerships for financing,
o) Construction, operation and maintenance of transport infrastructure including consideration for climate resilience and sustainability.

SL No	Personnel	Total Person Months
	Key Personnel	
1	Team Leader (Transport Specialist) -International	18
2	Deputy Team Leader (Trade & Supply Chain)-National	15
3	Deputy Team Leader (Transport & Infrastructure)-National	18
4	Transport Modeler (International)	8
5	Logistics Service Infrastructure Specialist (International)	8
6	Railway Specialist (International)	15

7	Inland Water Transport Specialist (International)	14
8	Ropeways Expert (International)	11
	Non-key Personnel	
1	Air Express Industry Specialist (International)	4
2	Industrial Zones Specialist (International)	6
3	Infrastructure Financing Specialist (International)	4
4	Transport Economist (National)	6
5	Traffic Engineer (National)	6
6	River Morphology Expert (International)	3
7	Climate Change Specialist (International)	6
8	Training and Capacity Development Specialist (National)	8
9	Environmental Safeguards Specialist (National)	6
10	Social Safeguards Specialist (National)	3
11	Aerial Ropeway Design Expert (International)	8
12	Transport Policy and Planning Expert (International)	6
13	PPP Expert (International)	4
14	Transport Planning and Data analyst (International)	6

Table 8. Staffing Requirements

The consultant may propose alternative staffing arrangements and person months in their technical proposal provided that the quality of tasks performed is not compromised and provided that all the reporting obligations are covered. The consultant may propose additional non-key personnel as necessary and reasonable to complete the work. All key and non-key personnel should be included in the financial proposal for each task.

15.1. **Qualifications and Experience of Key and Non-key Personnel**

The required qualification and experience of the key professional staff in the team are detailed as follows. All key staff are expected to speak and write English fluently. While some anticipated responsibilities are also included below for some key staff positions, these lists are not all-inclusive and it is the responsibility of the CONSULTANT to effectively manage its team to ensure that all items required in the scope for each task are completed.

15.1.1. Team Leader: The Team Leader would be expected to have an advanced university degree in Economics, Transport, Engineering or any other relevant field. A minimum of 15 years' demonstrated experience in strategic transport sector studies of this type will be required. Experience in a development context, ideally in the BBIN countries, would be welcome. Excellent communication skills, both orally and in report writing, are essential. At least 5 years' experience for designing large projects involving funds from multilateral and/or bilateral development banks (preferably ADB, World Bank, JICA, AIIB, Kawa, IFAD or other similar financiers). Proven leadership and project management capability, personnel management and

interpersonal skills, work skills in multi-disciplinary and multi-cultural team environments, excellent report preparation skills with computer literacy. International expert or experience working on projects in multiple countries and in multiple international regions is required.

15.1.2. Deputy Team Leader (02 Nos): Qualified transport, trade logistics and infrastructure planner, Master's or higher qualification in civil engineering, transport, trade logistics, supply chain or a relevant post-graduate degree. At least 20 years of working experience in planning, design, construction and maintenance of transport and trade logistics infrastructures projects, at least 5 years of which were in developing countries. Preferred experience in transport and trade infrastructure, supply chain and trade competitiveness projects in Bhutan, with knowledge management capabilities especially in the priority export and import sectors of Bhutan. Policy formulation, stakeholder engagement and proven analytical capacity would be considered as added advantage. At least 5 years' experience for designing large projects involving funds from different sources (preferably ADB, World Bank, JICA, Kawa, IFAD or other similar financiers). Proven leadership and project management capability, personnel management and interpersonal skills, work skills in multi-disciplinary and multi-cultural team environments, excellent report preparation skills with computer literacy.

15.1.3. Transport Modeler: The Transport Modeler would be expected to have an advanced degree in transport planning or a related field, and considerable experience in the production and use of strategic transport modelling for studies of this type. She/he would be expected to have a minimum of 10 years' demonstrated experience.

15.1.4. Logistics Service Infrastructure Specialist: The logistics service infrastructure specialist would be expected to be the holder of at least an advanced degree in supply chain and logistics management with demonstrated experience of at least 10 years in dry-ports, container freight stations, warehouse, off-dock and cold-chain facilities. Relevant qualifications and experience in logistics management in general, preferably in lower- & middle-income countries would be welcome. Excellent communication skills, both orally and in report writing, are essential.

15.1.5. Infrastructure Financing Specialist: The Infrastructure Financing Specialist would be expected to have an advanced university degree in Finance/Financial Engineering, Master of Business Administration, Business Economics or any other relevant field. She/he would be expected to have at least 7 years of professional experience in project finance, with a proven track record in financial valuation and financial modelling of PPP projects. Experience in transport projects will be an additional merit. Good English communication and writing skills, especially in report writing, are essential.

15.1.6. Transport Economist: The transport economist would be expected to be the holder of at least an advanced degree in transport economics or transport planning with demonstrated experience of at least 10 years in transport planning and travel demand forecast modelling, traffic engineering, and transport management. Relevant qualifications and experience in transport planning in particular, and traffic appraisal in general, preferably in lower- & middle-

income countries would be welcome. Excellent communication skills, both orally and in report writing, are essential.

15.1.7. Railway Specialist: The Railway Specialist would be expected to have over 12 years related experience in design, implementation, operation and/or management of railways, or similar experience gained on railway related projects. He/she must possess a degree in transport or in civil engineering with specialization in railways. He/she must have experience working in a team for work of this nature.

15.1.8. Inland Water Transport Specialist: The Inland Water Transport Specialist would be expected to have over 12 years related experience in IWT port/terminal design, implementation and management, or with similar experience gained on water transport related projects. He or she must possess a degree in port/marine engineering or in civil engineering with specialization in ports. He or she must have experience working in a team for work of this nature for IWT/ ports, harbors and piers.

15.1.9. Ropeways Expert: The Ropeways Expert would be expected to have at least 10 years of professional experience in projects involving cable car systems in mountainous areas, covering feasibility studies, planning, detailed design, procurement, execution, installation, civil works, operations, and maintenance. The expert must hold a university degree in Electrical/Mechanical/Civil Engineering, or a related field, and must have served as Team Leader or Technical Expert in at least two comparable projects of similar complexity. He/she should demonstrate in-depth knowledge of leading cable car suppliers, the latest technologies, technical solutions, contract structures, and international safety regulations. The expert is also expected to maintain a strong professional network within the global cable car industry to obtain market-sounding information and insights from key stakeholders. Significant international experience is required, with proven involvement in cable car installations in at least two countries outside the home country, preferably in new and emerging markets. Expertise in aerial ropeway safety analysis, requirements, and compliance with international standards is essential.

15.1.10. Air Express Industry Specialist: The Air Express Industry Specialist would be expected to have at least an advanced degree in air express industry or transport planning with demonstrated experience of at least 10 years in transport planning and travel demand forecast modelling, traffic engineering, and transport management. Relevant qualifications and experience in air express in particular, and traffic appraisal in general, preferably in lower- & middle-income countries would be welcome. Excellent communication skills, both orally and in report writing, are essential.

15.1.11. Industrial/ Economic Zones Specialist: The Industrial/ Economic Zones Specialist would be expected to have at least an advanced degree in logistics management with demonstrated experience of at least 10 years in economic zones preferably in lower- & middle-income

countries would be welcome. Excellent communication skills, both orally and in report writing, are essential.

15.1.12. Climate Change Specialist: The climate change specialist is expected to have advanced degree in climate change, environmental science, electro-mechanical engineering and relevant field. She/he would be expected to have hands-on experience in addressing climate change implications on modes of transport, particularly on roads and railways. Understanding of global treaties and agreements on climate change would be preferred. At least 5 (five) years relevant multi-regional international experience in working experience in analysis of and design for climate resilience. Proven climate change expertise, minimum 5 years of experience designing innovative climate resilient infrastructure in low lying areas prone to flooding, preferably authored articles in internationally prestigious academic journals for the same. International expert or experience working on projects in multiple countries and in multiple international regions is required. Good English communication and writing skills, especially in report writing, are essential.

15.1.13. Traffic Engineer: Minimum bachelor's degree in civil engineering, and a postgraduate degree in traffic engineering. Licensed as a traffic engineer in home country. Minimum 10 years' experience conducting traffic assessments and forecasts using modern traffic modeling software. Preferred experience in road safety and traffic engineering in developing countries, especially Bhutan.

15.1.14. Hydrologist / River Morphology Specialist: Minimum bachelor's degree in civil engineering, preferred, preferably post-graduate degree in Civil Engineering, Water Resources Engineering or Ecology in Aquatic Environments or Physical Geography. Experience on hydrology especially surface water hydrology is required. At least 5 (five) years relevant working experience with a focus on climate change adaptation (CCA). At least 5 (five) years relevant multi-regional international experience in working experience in analysis of and design for climate resilience. Proven climate change expertise, minimum 5 years of experience designing innovative climate resilient infrastructure in low lying areas prone to flooding, preferably authored articles in internationally prestigious academic journals for the same. International expert or experience working on projects in multiple countries and in multiple international regions is required.

15.1.15. Training and Capacity Development Specialist: Advanced degree in education, training and hands on experience in skills development, particularly in transport-related topics. Rich knowledge and network with regional and global training and skills development institutions. Thorough understanding of the skills gap in MoIT on IWT, Aerial ropeways and Railway thematic areas.

15.1.16. Environmental Safeguards Specialist: Minimum bachelor and graduate degree in Environmental Sciences. Minimum 10 years of experience in conducting EIA, experience in

preparing EMP, EHS audits, familiarity with the WB's ESF and requirements of 10 ESS standards.

15.1.17. Social Safeguards Specialist: Minimum bachelor and graduate degree in relevant subjects in Social Sciences. Minimum 5 years of experience in conducting SIA, experience in preparing Resettlement Action Plan for 2 comparable projects, familiarity with the WB's ESF and requirements of 10 ESS standards.

15.1.18. Aerial Ropeway Design Expert: The Aerial Ropeway Design expert must hold a university degree in Electrical/Mechanical/Civil Engineering, or a relevant field, and should have at least 5 years of professional experience in detailed design of aerial ropeways, feasibility studies, detailed engineering, procurement, installation, civil works, and maintenance of cable car systems in mountainous areas. He or she must have served as a designer or technical expert in at least two comparable completed projects of similar complexity. The expert is expected to possess sound knowledge of relevant technical specifications, including pylon design, station design, cable tensioning, and material specifications. Experience in cable car installation and commissioning, including supervision of associated civil works, will be considered an advantage.

15.1.19. Transport Policy and Planning Expert: The Transport Policy and Planning expert must hold an M.Sc. degree in Transport Planning, Transportation Engineering, Transport Economics, or a related discipline, with at least 10 years of professional planning experience. He or she should have a minimum of 5 years' experience in transport sector planning at the sectoral level, including multimodal transport planning, with ropeway planning experience considered an advantage. The expert must have prior experience in at least two feasibility studies as a transport planner and should demonstrate strong expertise in data analysis, multimodal travel demand modeling, and data-driven policy formulation. Familiarity with Public-Private Partnership (PPP) models and policies is desired, along with proficiency in planning software, GIS-based modeling, and data analysis tools to support evidence-based planning.

15.1.20. PPP Expert: The PPP expert must hold a postgraduate or master's degree in Finance, Management, Economics, Engineering, Law, or a related field, with a minimum of 15 years of demonstrated experience in project management. He or she should have at least 5 years of specific experience in providing PPP transaction advisory services or developing infrastructure projects on a PPP basis, including extensive expertise in project structuring, risk analysis, allocation and management, project agreements, bid process management, preparation of bidding documentation, and post-bid monitoring. The expert must have successfully prepared PPP projects with at least three financially closed transactions, of which at least one should be in the water and sanitation sector. Relevant qualifications and experience in transport infrastructure development, operations, and maintenance projects are required, with particular emphasis on work in developing countries. Strong English communication and writing skills, especially in report preparation, are essential.

15.1.21. Transport Planning and Data analyst: The Transport Planning and Data analyst must hold a Bachelor's degree in Transport Planning, Transportation Engineering, Transport Economics, or a related discipline, with at least 5 years of professional experience in transport sector and project or master planning. He or she should have a minimum of 3 years' experience in planning and designing transport sector initiatives or projects, with demonstrated expertise in multimodal transport planning. Prior experience in at least two feasibility studies is required. In addition, the expert should have experience in qualitative data analysis, report writing, and presentations. Proficiency in the use of planning software, along with skills in data processing, extraction, GIS-based modeling, and data analysis to support planning activities, is also desired.

16. INSTITUTIONAL ARRANGEMENTS AND COUNTERPART SUPPORT

16.1. Coordination with the Ministry of Infrastructure and Transport (MoIT)

The Ministry of Infrastructure and Transport (MoIT) will serve as the primary counterpart agency for this assignment. The Consultant shall undertake and follow these directives:

16.1.1. Work Under the Overall Guidance of MoIT: The Consultant will operate under the strategic guidance and oversight of the designated Project Coordinator or others as designated or assigned by the MoIT. All technical, administrative, and logistical aspects of the assignment shall be aligned with the directives issued by MoIT.

16.1.2. Engage with Relevant Departments and Agencies

The Consultant shall coordinate closely with relevant MoIT departments including:

a) Department of Surface Transport (for road and rail matters)

b) Department of Air Transport

c) Department of Trade (as applicable)

d) Bhutan Construction and Transport Authority (BCTA)

e) Other line ministries, autonomous agencies, and development partners as directed by MoIT.

16.1.3. Participate in Coordination Meetings: The Consultant shall participate in regular coordination meetings chaired by MoIT or its delegated Project Steering Committee. These meetings may include other government stakeholders and development partners.

16.1.4. Support Government-Led Processes: The Consultant is expected to facilitate and support government-led consultations, data collection, and validation workshops, ensuring full stakeholder ownership of findings and recommendations.

16.2. **Reporting Lines and Communication Protocols**

16.2.1. To ensure effective communication, timely feedback, and quality control throughout the assignment, the Consultant shall adhere to the following protocols:

16.2.1.1. Designated Reporting Authority: The Consultant shall report directly to the Project Manager of Multimodal Transport and Trade Logistics Assessment (SIT), DoST, for all matters related to deliverables, timelines, coordination, and approvals.

16.2.1.2. Project Steering Committee Engagement: The Consultant shall provide periodic briefings to the Project Steering Committee (if constituted) or Project Management Unit (PMU), and present key findings, interim results, and draft/final deliverables for feedback and endorsement.

16.2.2. Submission of Deliverables

16.2.2.1. All draft and final reports shall be submitted in both soft copy and three (3) hard copies to MoIT.

16.2.2.2. Deliverables must be submitted in a timely manner according to the agreed work plan and contractual schedule.

16.2.2.3. All documents must be clearly labelled, dated, and version-controlled.

16.2.3. Language of Communication: English shall be the working language for all reports, official correspondence, meetings, and documentation.

16.2.4. Communication Channels

16.2.4.1. Primary communication will be via email, supplemented by in-person meetings, video conferences, and phone calls as needed.

16.2.4.2. A shared communication log or project tracker (e.g. email thread summaries or shared drive updates) shall be established by the consultant to ensure transparency and continuity.

16.2.5. Responsiveness and Turnaround

16.2.5.1. The Consultant shall acknowledge all official correspondence within two (2) working days.

16.2.5.2. Where feedback or clarifications are requested by MoIT, the Consultant shall respond within five (5) working days unless otherwise agreed.

16.2.6. Confidentiality and Disclosure: The Consultant shall treat all information received from MoIT and other stakeholders as confidential unless otherwise authorized. No part of the deliverables may be published or shared externally without MoIT's prior written consent.

17. COMPLIANCE WITH WORLD BANK PROCUREMENT REGULATIONS

17.1. Eligibility

17.1.1. Ensure that the Consultant and all proposed experts meet the eligibility criteria as defined in the Procurement Regulations.

17.1.2. Avoid any conflicts of interest in accordance with Section 3.17 of the Procurement Regulations.

17.1.3. Declare any actual or potential conflict of interest and provide mechanisms to mitigate such risks if applicable.

17.2. Selection and Contracting

17.2.1. Cooperate fully with the implementing agency and the World Bank during the selection process.

17.2.2. Provide complete and accurate information in proposals and related documents.

17.2.3. Refrain from engaging in any collusive, corrupt, coercive, or obstructive practices.

17.3. Contract Execution

17.3.1. Follow all agreed procedures and contract provisions in executing the services.

17.3.2. Allow and support the World Bank's or Implementing Agency's supervision and audit missions, and make all relevant documentation and personnel available.

17.3.3. Maintain proper documentation, including financial and activity records, for review and audit purposes.

17.4. Sanctions

17.4.1. Acknowledge that the World Bank may impose sanctions (e.g., reprimand, suspension, debarment) in cases of non-compliance with its anti-corruption and procurement guidelines, and accept the consequences as provided for in the Procurement Regulations.

17.5. Ethical Conduct

17.5.1. Uphold the highest standards of ethics and professional integrity throughout the assignment.

17.5.2. Ensure that all personnel involved in the assignment are informed of and comply with these standards.

17.6. **Subconsultants and Associates**

17.6.1. Ensure that any subconsultants or associated firms proposed or engaged for the assignment also comply with the applicable provisions of the Procurement Regulations.

17.7. Failure to comply with the above requirements may lead to rejection of the Consultant's proposal, termination of the contract, or other remedies as deemed appropriate by the World Bank or the Implementing Agency.

18. SELECTION PROCEDURE

The Consultant will be selected following the Quality and Cost-Based Selection (QCBS) method as set forth in the World Bank Procurement Regulations for IPF Borrowers, September 2023.

ANNEXURE – BACKGROUND AND CONTEXT

1. ANNEXURE I: BACKGROUND

The World Bank's Accelerating Trade and Transport Connectivity in Eastern South Asia (ACCESS) Multi-Phase Programmatic Approach (MPA) consists of a series of linked transport and trade facilitation projects in eastern South Asia designed to increase the efficiency and resilience of trade and transport along selected regional corridors. The ACCESS Program was approved on June 28, 2022, with Phase 1 covering Bangladesh ($753m) and Nepal ($275m). ACCESS Phase 2 with $300m allocation for Bhutan was approved by the World Bank Board on May 01, 2025. The project development objective is to enhance the resilience and efficiency of trade and transport along selected corridors in Bhutan ("Project").

The ACCESS program framework consists of three main pillars: (a) Digital Systems for Trade: provision of digital solutions and automation, designed to eliminate manual and paper-based processes, resulting in faster border crossing times; (b) Green and Resilient Infrastructure: enhancing regional corridors, infrastructure, and trade gateways; and (c) Institutional and Policy Strengthening for Transport and Trade: technical assistance and capacity building for trade and customs modernization.

The Royal Government of Bhutan (RGoB) prepared the Bhutan phase of the ACCESS Project ($300m), including but not limited to targeted road investments, digital trade systems, and relevant enablers that are aligned with ACCESS objectives. The implementing agencies for the project are the Ministry of Infrastructure and Transport (MoIT, the lead agency) and the Government Technology Agency (GovTech), in coordination with other relevant stakeholders and technical partners. In addition, a Multi-Sectoral Project Steering Committee (MSPSC) was formed to oversee high-level technical issues related to ACCESS. The Committee is Co-Chaired by the MoIT Secretary and GovTech Secretary, and currently consists of representatives from MoF, GovTech, Ministry of Industry, Commerce, and Employment (MoICE), and Ministry of Foreign Affairs and External Trade (MoFAET).

2. ANNEXURE II: OVERVIEW OF TRANSPORT AND TRADE CONNECTIVITY IN BHUTAN

2.1. Introduction

2.1.1. Bhutan has unique geographical, historical, and cultural characteristics. A small, landlocked country nestled in the Himalayas, Bhutan has steep mountains, deep valleys, and scattered settlements. Nearly half the country's land area is protected to preserve biodiversity. The country's constitution stipulates that 60 percent of all land must be covered by forests at any time. This constitutional requirement is indicative of Bhutan's commitment to preserving its unique natural, cultural, historic, and religious characteristics.

2.1.2. The country's unique philosophy is expressed by Bhutan's Gross National Happiness (GNH) as the guiding principle of development. The philosophy of preservation and conservation has been coupled with rapid development progress and economic growth in the last decade.

Much of the growth has been driven by hydropower development and the sale of electricity to neighboring India. The country's GDP growth has averaged at 7.5 percent per year over the past three decades, making Bhutan one of the fastest-growing countries in the world. The country is approaching the threshold for upper-middle-income countries, and it has graduated from the Least Developed Countries (LDC) category on December 13, 2023.

2.1.3. As a landlocked economy with a small domestic market, Bhutan could significantly benefit from deeper regional integration with its neighbors. While Bhutan's trade has grown robustly over the past decade, opportunities for growth through trade remain largely untapped. A key obstacle to trade is the disproportionately high costs of trading Bhutan's trade suffers from the typical problems affecting all landlocked countries, notably delays when passing through seaports in neighboring countries, inefficiencies at land border crossings, limitations on routes for transit cargo, and overreliance on road transport. These challenges are compounded by complex trade processes, inadequate transport and trade-enabling infrastructure, and high compliance costs associated with non-tariff measures.

2.2. Bhutan's Trade Profile

Bhutan's export of goods and services was valued at BTN 60.602 billion (US$730m) in 2019, accounting for 34 percent of the GDP[1]. The total value of imports was BTN 89.726 billion (US$1.1bn), representing around 50 percent of the GDP. In terms of trade value, Bhutan's main export commodities are iron & steel, processed minerals, and cement and clinker whereas its main import commodities are petroleum products, iron & steel, motor vehicle/cars, and electric machinery and equipment.

India is by far Bhutan's largest trading partner. Trade with India accounts for 84 percent of Bhutan's total exports and about 82 percent of imports. Bangladesh is Bhutan's second largest export market, representing 20 percent of its total exports. Bangladesh is one of a few countries with which Bhutan has a positive balance of trade. Bhutan's exports to Nepal have also increased, albeit small, reaching US$5m in 2019. Other important trading partners of Bhutan are the European Union, Thailand, and United Arab Emirates.

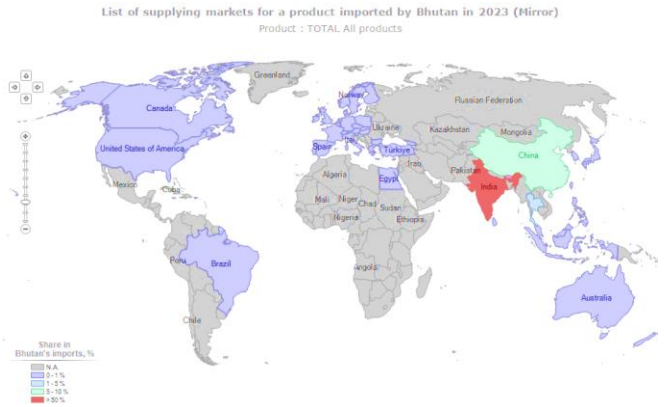
[1] UNDP, Diagnostic Trade Integration Strategy Update 2020

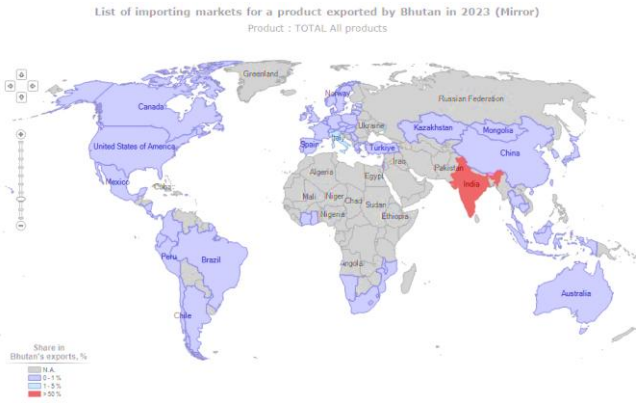
Bhutan's balance of trade for 2019-2024						
TRADE	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Exports	**31,250.00**	**20,732.24**	**33,555.48**	**34,396.00**	**36,244.00**	**43,362.00**
India	23,573.00	15,989.55	26408.86	26698.00	27913.00	31311.00
Third Countries	7,677.00	4,742.69	7,146.63	7,697.00	8,331.00	12,051.00
Imports	**68,906.00**	**66,456.12**	**90,229.00**	**118,792.00**	**106,544.00**	**115,241.00**
India	56,453.00	51,197.87	71,235.90	85,093.00	85,138.00	95,380.00
Third Countries	12,453.00	15,258.26	18,993.10	33,699.00	21,406.00	19,861.00
Balance of trade	**-37,656.00**	**-45,723.88**	**-56,673.51**	**-84,397.00**	**-70,300.00**	**-71,880.00**
India	-32,880.00	-35,208.31	-44,827.04	-58,395.00	-57,224.00	-64,070.00
Third Countries	-4,776.00	-10,515.57	-11,846.47	-26,001.00	-13,705.00	-7,810.00

Source: Statistical Year Book 2025 & 2023 - Bhutan

Table 9. Bhutan's balance of Trade for 2019-2024

Bhutan's footprint on global trade has been expanding. Although India is the largest trading partner, Bhutan has one of the most diverse markets in import and exports. Amongst the top 10 importers are India, China, Singapore, Thailand, Hong Kong, Bangladesh, Sweden, Nepal, Germany, South Africa and top 10 exporters include India, Bangladesh, Italy, Nepal, China, South Korea, Spain, Netherlands, France, Japan. The maps below cover the diverse set of markets Bhutan has been trading with.





Diverse set of markets and diverse range of products, but logistics challenges prevail. The key challenges include, but not limited to, the following;

a) Geographical terrain- mountainous terrain, winding and steep roads, remote production centers.
b) Limited road, rail and air infrastructure.
c) Limited connectivity- landlocked and reliance on neighbors for access to international markets.
d) Harsh weather- landslide and road blockage during monsoon, disrupt logistics operations.
e) Earthquakes- seismically active region, making infrastructure vulnerable to

earthquakes and associated damages.

f) High Transportation Costs.
g) Small Market Size for large scale logistics investments.
h) Cross-border trade regulations.
i) Absence of modern logistics technologies.
j) Slow adoption of digital systems.
k) Policy coordination and implementation.

Bhutan has significantly improved its performance in the World Bank Logistics Performance Index (LPI) but its comparator countries are constantly thriving. The graph below reflects Bhutan's performance in LPI in different indicators over the last couple of years. The next graph presents a comparative performance of Bhutan with other South Asian countries.

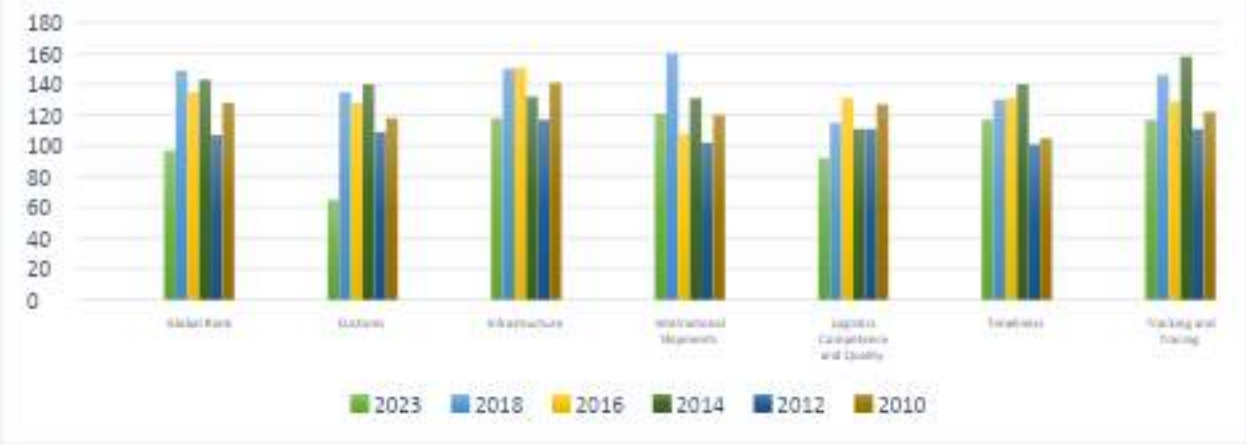


Figure 3. LPI and Bhutan

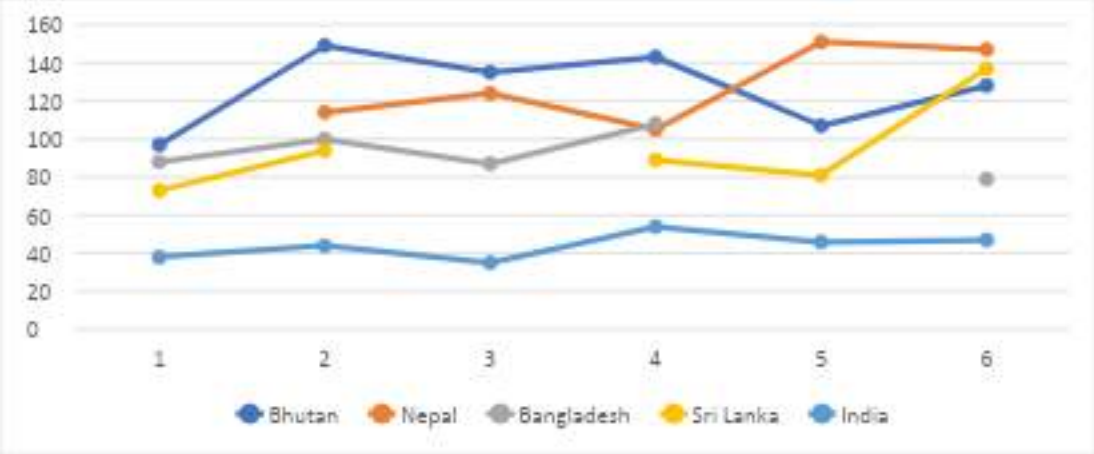


Figure 4. Bhutan and its competitor in LPI Ranking

2.3. Global, Regional, and Bilateral Trade and Transit Agreements

2.3.1. Bhutan has announced that it will resume accession to the World Trade Organization (WTO), after suspending its membership accession for nearly a decade. By joining the WTO, Bhutan will be able to take advantage of benefits, including special and differential treatment provisions for countries newly graduated from least developed country (LDC) status. Bhutan is set to graduate from LDC status in December 2023. By joining as an LDC member, WTO will give Bhutan three years to comply with WTO rules and standards, with the possibility of two years extension.

2.3.2. Bhutan is a member of the Revised Kyoto Convention (RKC), which aims to simplify and harmonize customs procedures. The country has aligned its customs legislation with the RKC and is in the process of revising relevant laws and regulations in accordance with the RKC. Bhutan is a contracting party to the International Plant Protection Convention (IPPC) and as such needs to abide by the IPPC International Standards for Phytosanitary Measure (ISPM). Bhutan is not a signatory to the WTO Trade Facilitation Agreement (TFA), but this may be considered once the WTO accession is completed. Further, Bhutan is an observer to the Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific, which is under the aegis of UNESCAP. The DTIS 2020 update estimated that if Bhutan implements the trade facilitation measures included in the WTO TFA along with paperless trade, it could achieve trade cost reductions of around 30 percent.

2.3.3. Bhutan is a founding member of the South Asian Association for Regional Cooperation (SAARC). The country is part of the South Asian Free Trade Area (SAFTA) – a free trade arrangement under SAARC based on the principles of national treatment, reciprocity and mutual benefits. Bhutan has also signed the SAARC Preferential Trading Arrangement (SAPTA) and the SAARC Agreement on Trade in Services. Bhutan is a member of the Bay of Bengal Initiative for Multisectoral Technical and Economic Cooperation (BIMSTEC). It recently (June 2023) ratified the BIMSTEC Charter which will pave the way for the country to fully reap the benefits of BIMSTEC's initiatives.

2.3.4. Bhutan has signed several bilateral agreements on trade and transit with its neighboring countries. The Agreement on Trade, Commerce and Transit between Bhutan and India governs bilateral trade between the two countries. The Agreement has been updated and renewed five times since it was signed in 1972. The latest version of the agreement (2016) provides for free trade for all products. It will remain in force for 10 years unless the two countries agree to amend this period. The Government of India grants Bhutan transit rights through land, air and sea for trading with the rest of the world. Kolkata and Haldia seaport are most commonly used for trading with third countries. Under the transit agreement, Bhutan Customs maintains a Liaison Office of Transit office at Kolkata which facilitates the transit movement of Bhutanese third country trade traffic.

2.3.5. Bhutan has several trade and transit agreements with Bangladesh. The Bhutan-Bangladesh Trade Agreement, signed in 2014, provides "most favored nation" treatment and facilitation

of trade for pre-identified commodities and transit corridors. The preferential trade agreement (PTA) from 2020 stipulates duty benefits of 34 export products from Bhutan (and 100 from Bangladesh). The two countries recently (March 2023) signed a transit agreement under which Bhutan can use Bangladesh's land, air, and waterways to move goods to and from a third country in exchange for transit fees. This transit agreement was approved and ratified by Bhutan's upper house (October 2023). Bhutan and Bangladesh have also signed an MoU (April 2019) stipulating the use of inland waterways for the transportation of bilateral trade and transit cargoes. Bhutan is also in negotiations with Nepal to sign a bilateral trade agreement.

2.4. Bhutan' Policy and Regulatory Framework for Trade and Transport

2.4.1. The most important elements of Bhutan's trade policy have been set out in the 13th Five-Year Plan 2023-2028. The plan aims to reduce Bhutan's trade deficit through (i) diversification both in terms export products and markets, (ii) modernization of trade and logistics, and (iii) implementation of policy and regulatory reforms. It will seek to bolster the "Brand Bhutan", a strategy developed by the government towards diversification of the export base. It aims to develop products with "Made in Bhutan" packaging that highlights positive attributes of the country.

2.4.2. The Transport 2040 Integrated Strategic Vision lays out the broad contours of the country's plans for road network development, road transport, urban transport, civil aviation, regional connectivity, and overall transport sector management. It comprises of an overall goal, supporting objectives, and a series of integrated strategies to guide government policy and investment planning. It assumes that the fleet size may increase tenfold from 2010 level in 2040 (predicted fleet size in 2040 is almost 400,000 meeting levels of developed countries unless measures are taken to constrain growth) led by increased income and development; transport demand will be huge and associated externalities like congestion and pollution would increase significantly.

2.4.3. The National Transport Policy of Bhutan (2017) covers policy objectives and a framework for institutional arrangements in the transport sector. It describes the existing landscape for important transport sub-sectors (roads and road transport, urban transport, civil aviation, regional connectivity) and details policy objectives and the related benchmarks to meet those objectives. A new National Surface Transport Policy is under development (2024), and will also include other modes of transport, notably inland waterway transport and railways. It will be important for the new policy to carefully consider the integration and between the different modes from a functional and operational perspective.

2.4.4. Bhutan's road transport is regulated by the Road Act of Bhutan 2013; and Road Safety and Transport Regulations (1999), which was updated in January 2019. The regulations specify procedures for (a) road type, administrative roles, new road development requirements, toll order, approval of works, duty of the users, right of way, safety standards, road signs etc. (b) registration, renewal, and transfer of ownership of motor vehicles; (c) the granting of a learner's license, driver's license, including driving instructor's license; (d) fees to be paid for

transactions; and (e) powers to the authorities for the cancellation or suspension of the registration and driving license.

2.4.5. The civil aviation sector of Bhutan has been restructured and has adopted several reforms since 2009[2]. The Civil Aviation Act of Bhutan, 2000 was updated in 2016 and currently serves as the instrument to regulate and administer civil aviation. The separation of regulatory and operational functions of the Department of Civil Aviation took place in April 2015. As a result, the Bhutan Civil Aviation Authority (BCAA) serves as a regulator while the Department of Air Transport (DoAT) serves as an airport operator. The DoAT reports to the Ministry of Infrastructure and Transport and is responsible for ensuring safe, regular, and effective operation of flights, air communication, navigation, and transportation services for both domestic and international services.

2.4.6. The Customs Act of Bhutan (2017) regulates the import and export of goods in Bhutan. It provides for the assessment and collection of customs duties and taxes. The Act is aligned with the provisions and regulations of the RKC and other international good practices. The Customs Rules and Regulations of Bhutan were revised and adopted in 2017 and defines procedures and documentation required for EXIM trade as well as tariff and non-tariff measures to regulate EXIM trade. The Foreign Exchange Rules and Regulations (2022) regulates foreign exchange transactions in Bhutan and requires authorization from the Royal Monetary Authority for certain transactions, such as foreign currency transfers and payments to non-residents.

2.4.7. Bhutan's legal and regulatory Sanitary and Phytosanitary (SPS) frameworks are relatively young, reflecting the short amount of time that Bhutan has actively sought to trade with diverse international markets[3]. The domestic food safety and quality are governed by (i) Food Act of Bhutan 2005 which is guided by the National Food Quality and Safety Commission and implemented through the Food Rules and Regulations of Bhutan 2017; (ii) Biosafety Act of Bhutan 2015, implemented through the Biosafety Rules and Regulations 2018; (iii) Plant Quarantine Act of Bhutan 1993; (iv) Livestock Act of Bhutan 2001; and pesticides Act of Bhutan 2000. The Bhutan Standards Act governs Technical Barriers to Trade (TBT) measures in Bhutan. It identifies which domestic entities will oversee product certification and provides guidance on establishing associated schemes.

2.5. Transport Sector Assessment Overview

The following sections provide an overview of Bhutan's transport modes – road, inland waterway, railway, aerial ropeways, and aviation, and transit routes. The first four modes are under the responsibility of the Department of Surface Transport whereas aviation falls under the Department of Air Transport – all under the Ministry of Infrastructure and Transport (MoIT).

[2] ADB. 2019. Kingdom of Bhutan: Enhancing Aviation Sector Development Capacity.

[3] Asian Development Bank; Potential Exports and Nontariff Barriers to Trade: Bhutan National Study

2.5.1. **Road Transport**

Road transport is the dominant mode of transport in Bhutan, carrying more than 90 percent of trade traffic. The country is served by a road network of 18,265 km (June 2021) with 109,663 registered vehicles (as of 2020). Primary and secondary national highways account for 16 percent, Dzongkhag roads (district roads) account for 14 percent, and the balance of 70 percent are urban, farm, and access roads. The Government is currently developing the Bhutan's Masterplan for National Highways Connectivity and road maintenance plan, financed by a grant from the ADB.

	Bhutan Road Classification	**Jurisdiction**
i.	International/Asian Highways	DoST
ii.	Primary National Highway	DoST
iii.	Secondary National Highway	DoST
iv.	Dzongkhag Road	DoST
v.	Thromde (Urban) Roads	Respective Municipalities
vi.	Farm Roads	Dzongkhags
vii.	Access Roads	Local Government

Table 10. Bhutan Road classification and its Jurisdiction

2.5.1.1. Based on a World Bank-commissioned condition assessment, road connectivity was observed to be inadequate beyond district/Dzongkha headquarters. Most of the highways (92 percent) are sealed (mostly asphalt surfaced), 63 percent of Dzongkhag roads are sealed, and only 5 percent of feeder and access roads are sealed. The surface condition of sealed roads is generally fair. However, upgrading the Bhutanese highways to current Asian Highway Standards would be recommended.

2.5.1.2. From an international trade perspective, the highway between Phuentsholing and Thimphu is the most critical corridor. This corridor (AH-48) has a traffic volume of 3,000 PCUS per day with around 7,000 and 10,000 PCUs per day near Phuentsholing and Thimphu, respectively. The AH-48 is the only Asian Highway in Bhutan. Thimphu-Wangdue-Trongsa-Monga-Trashigang (east-west direction in the north), and Trashigang-Samdrup Jongkhar (north-south direction in the east) are other important corridors. These roads carry a traffic volume of about 1,000 PCUs per day. Other highways have traffic volumes of less than 500 PCUs per day, and most of the Dzongkhag/district roads have traffic of less than 200 PCUs per day.

2.5.1.3. The traffic volume on the Primary National Highways (PNH) was in the range of 500 to 1,000 PCUs per day during 2021[4]. Traffic composition in Bhutan is typically:

a) 80% are light vehicles (such as cars and jeeps);

b) 2% are two-wheelers;

c) 8% are medium vehicles; and

d) 10% are heavy vehicles

2.5.1.4. PNHs are roads of strategic importance carrying high traffic volumes (relatively) and connecting three or more Dzongkhag centers. PNH typically has 30m Right of Way, 10.5 m road formation width, including 7.5m carriageway (mostly of thin asphalt surfaced, Class III of Asian Highway Classification). Some of the PNHs were built in 1960s and 1970s, and mostly in collaboration with India through the Border Roads Organization (BRO).

2.5.1.5. Bhutan is generally well connected in an east-west direction in the northern half of the country (known as the Lateral Road). However, the southern part of the country lacks a continuous highway providing east-west connectivity. The Southern East-West Highway (SEWH) - running parallel to the Indian border - has been considered in government priority plans as one of the major pieces of missing infrastructure in the country. The SEWH starts from Samtse in the west and extends up to Jomotsongkha in the east, via Phuentsholing, Nichula, Sarpnag, Gelephu, Pangbang, Nganglam, and Samdrup Jongkhar. This corridor is 557 km long and has three missing links: Lhamoizingkha to Sarpang, Gelephu to Panbang, and Nganglam to Dewathang (see *Figure 5)*.

[4] Source: Department of Roads, Thimphu

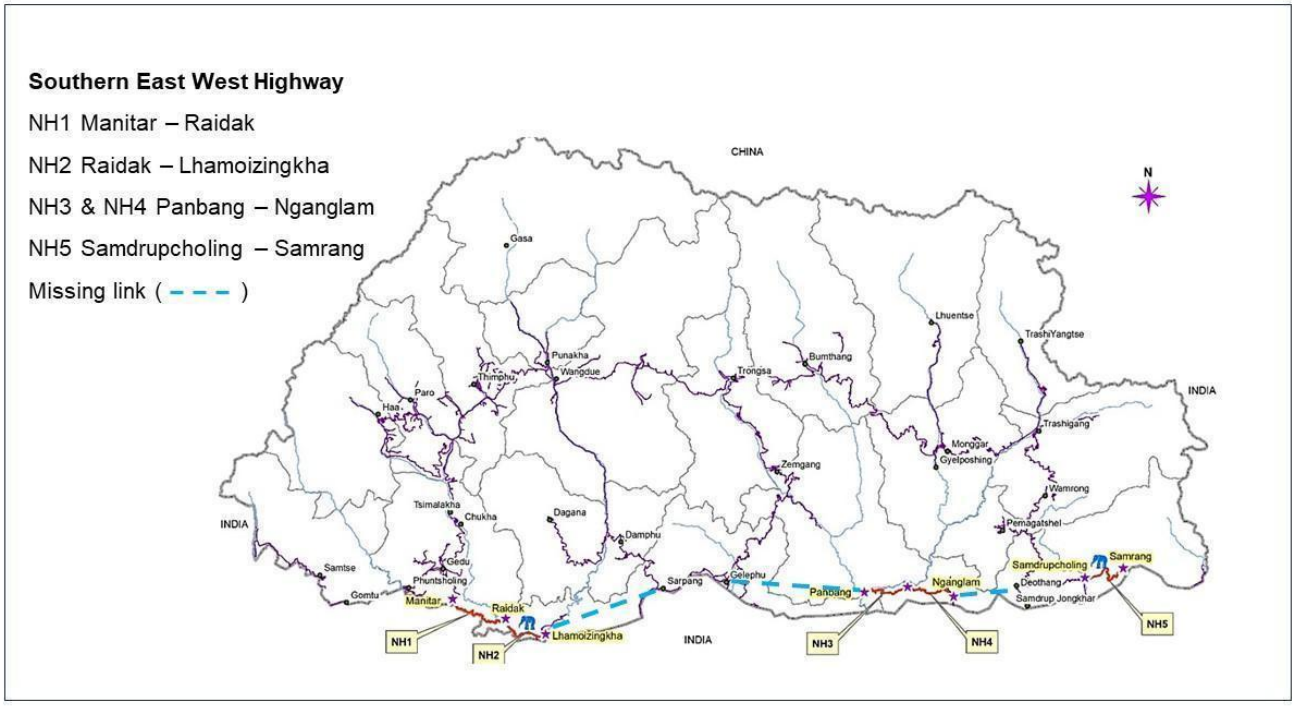


Figure 5. Missing Links of SEWH (Source: DoST)

2.5.1.6. The absence of a complete SEWH means Bhutanese traffic has to pass through Indian territory in moving from one part of the country to another. Such movement increases costs in three main respects: (i) border clearance costs in the form of time to comply with transit entry and exit procedures for both countries, (ii) delays en-route in India where Bhutanese traffic often gets caught-up by traffic waiting to clear state procedures between Assam and West Bengal, and (iii) increased un-reliability due to frequent demonstrations and road blockages on the Indian routes.

2.5.1.7. The Government is developing several industrial clusters along the southern border, which have a bearing on the demand for logistics infrastructure and services. As these industrial estates are developed, the volume of traffic will increase. The completion of the SEWH can therefore be considered to reduce time and cost of travel, as well as to promote linkages between future industrial, manufacturing, and commercial centers along the southern border areas. Each of the proposed industrial estates (Pasakha, Samtse, Gelephu, Samdrup Jongkhar) has a proposed specialization including minerals, industrial products, and fruit. Gelephu has great potential as a trade gateway for Bhutan with scope for multimodal connectivity to India and Bangladesh. The RGoB plans to develop a mega-city in Gelephu and as a major freight consolidation center which will also increase traffic demand.

2.5.1.8. A World Bank transport demand model estimates that traffic on the majority of Bhutan's corridors would be less than 4,000 PCUs per day by 2045. Therefore, the current standard of the PNH, which equals to 2-lane with earthen shoulders, would be adequate in terms of capacity. However, a 2-lane paved shoulder configuration increases travel speeds without compromising road user safety. The same holds good for other surveyed corridors with the exception of two sections - Phuentsholing-Thimphu and Sarpang-Gelephu - where the traffic by 2045 is estimated to be above 9,000 PCUs per day. Similar traffic growth may be assumed between Gelephu and Panbang considering the many developments around Gelephu and the expansion of industrial clusters in the east. Therefore, 4-laning of these sections and improvement of bridges (which are currently temporary type, narrow, and weak) and addressing geotechnical issues at specific locations would also be recommended.

2.5.2. **Inland Waterway Transport (IWT)**

2.5.2.1. IWT is a clean and energy-efficient mode of transport with potential to reduce logistics costs, emissions, and traffic congestion. IWT would allow Bhutan to increase exports of boulders and minerals mined in the southern part of the country. IWT may also be used together with rail to form new multi-modal linkages. Moreover, potential IWT linkages to the border town of Gelephu located on the Aie River (the western most tributary of the Manas-Beki River system) would also align with the government's plans to develop this city into a multi-modal transit hub.

2.5.2.2. Bhutan has commenced exploring the use of waterways as an alternative option to the movement of goods by road. Bhutan and Bangladesh have entered into a MOU and Standard Operating Procedures on the use of IWT for bilateral and transit cargo. As part of the agreement, Chittagong and Mongla ports in Bangladesh have been identified as gateway ports for international trade for Bhutan, with the river port of Narayanganj (Bangladesh) as a primary port of call for bilateral trade. Dhubri on National Waterways 2 (NW-2) is the exit/entry point (transiting) in India.

2.5.2.3. The first movement of Bhutan stone chips to Bangladesh started in July 2019. The stone aggregates are transported by trucks from Phuentsholing, 160 km from the Dhubri jetty in Assam, to Narayanganj in Bangladesh through India's NW 2 and Bangladesh's Jamuna River (on the Indo- Bangladesh Protocol Route). For a distance of 600 km on inland waterways (Dhubri to Narayanganj), it took six days. It is estimated that the movement of stone aggregates on waterways from Phuentsholing to Narayanganj reduces transportation and logistics costs by 30 percent compared to roads.

2.5.2.4. In order to meet the growing demand of stones from Bhutan to Bangladesh, the multi-modal logistics park (MMLP) at Jogighopa in Assam state in India may accommodate such traffic in future. The Jogighopa MMLP will be equipped to invite higher capacity vessels with mechanical loading facilities, resulting in further reduction in transportation costs.

Secondly, Jogighopa is closer to Samdrup Jhonkhar LCS on India-Bhutan border, as compared to Dhubri. Thirdly, Dhubri is developed as a multi-cargo IWT terminal, with capacity to accommodate vessels up to 600 deadweight tonnage (DWT) and may not be able to accommodate future volumes of stone demand.

2.5.2.5. While Bhutan has a network of east-west tributaries and major north-south rivers, domestic movement of commercial vessels has not materialized. Bhutan's main rivers are : The four major rivers of Bhutan are Drangme Chhu, Wang Chhu, Mo Chhu, and Torsa Chhu. These rivers originate from the high-altitude alpine zones and flow southward into the Brahmaputra River in India. Bhutan's rivers generally have steep gradients and narrow, steep-sided valleys, which occasionally open up to give small areas of flat land for cultivation. The south-west monsoon brings heavy rainfall from May to October, followed by pronounced dry season in winter. The difference between maximum and minimum river flow in monsoon and the dry months is as much as 20 times.

2.5.2.6. IWT for freight between the southern foothills - known as the Duars[5] - and the Brahmaputra/Jamuna River may be a viable option for Bhutan. The Duar Plains extend in places 12 to 16 kilometers into Bhutan. Not all - and perhaps none - of the rivers would be suitable for navigation purposes, mainly due to the seasonal and low nature of discharge flows (especially on those rivers originating in the lower foothills); steepening gradients in or close to the foothills; and the porosity of the formation.

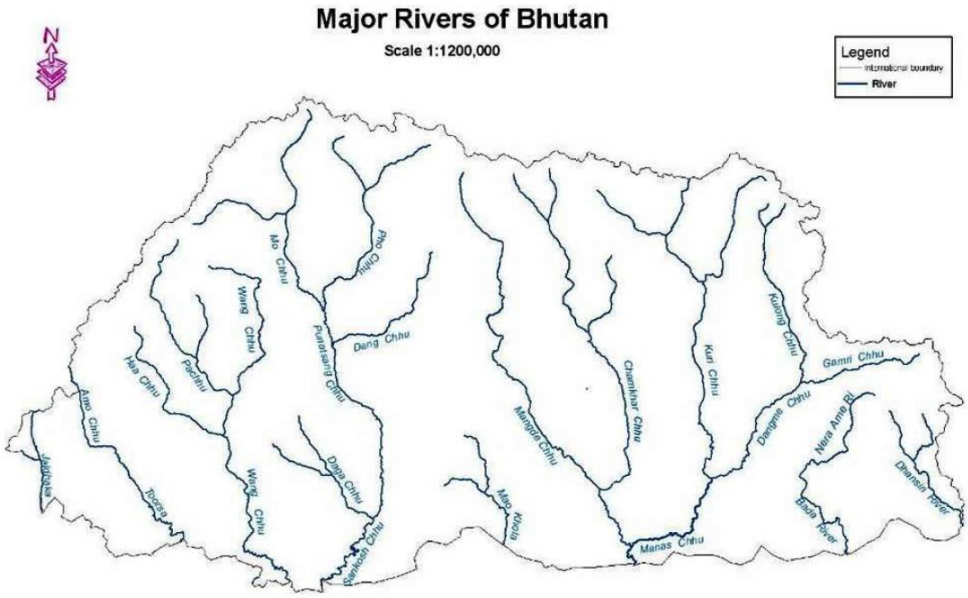


Figure 6. Major Rivers of Bhutan

[5] The Duars (or Dooars) are the floodplains and foothills of the eastern Himalayas in Northeast India around Bhutan. Duar means 'door' in local languages, and the region forms the gateway to Bhutan from India.

2.5.2.7. During the dry season, many of the smaller rivers disappear underground in the foothills. They re-emerge as springs in the lower southern portion of the Duars where a substratum of clay forces the flow to the surface. From these points onwards, however, the topography is such that the smaller rivers flow more slowly through generally well-defined channels. Seasonal floods, however, complicate navigation with the rapid and frequent variations in water discharge. In some sections, this creates a braided tendency on the plains where the rivers are characterized by a network of channels separated by small and temporary bars. A World Bank assessment (in 2014) of the potential for IWT in Bhutan found that eight rivers that merit investigation for IWT purposes. These include the Singimari, Torsa, Raidak/Sankosh, Gourang, Champabati, Aie, and Beki rivers.

2.5.2.8. In order to address some of the challenges facing IWT development in Bhutan, it would be recommended to undertake topographic surveys and mapping and feasibility studies. This would determine a) the navigability of the proposed rivers; and b) the economic and financial feasibility of their development into navigation channels for transport.

2.5.2.9. World Bank conducted a scoping assessment of select rivers in November 2024. Brahmaputra basin spreads over 580,000 Sq.km including China (50.5%), India (33.6%), Bangladesh (8.1%) and Bhutan (7.8%). Ninety Six percent (96 %) of Bhutan's area falls under this Basin, although the main river does not flow through Bhutan. Six rivers join the National Waterway and Indo-Bangla Protocol Routes- Diana, Amo Chhu or Torsa, Raidak or Wang Chhu, Sankosh, Mao Khola and Manas. As they join the National Waterway-2 and IBP route, there is a possibility of forming of the Bhutan, India, Bangladesh integrated waterway. The team considered Class 1 river with min of 1.2 m depth, 30 m bottom width, 300 m bend radius (BR), 4 m vertical clearance (VC) and 30 m horizontal clearance (HC) between piers. i.e. Least Available Depth (LAD)=1.2, W=30m, VC= 4m, HC= 30m, BR=300m with min 75 cusec discharge, and about 100MT carrying capacity.

Figure 7. NW-2 and IBP Routes and enabling Regional connectivity

2.5.2.10. **Diana River at Samtse** is one of the main tributaries of the Jaldhaka with its origin in Sikkim. It traverses a total distance of 186 km passing through Bhutan, Darjeeling, Jalpaiguri and Koch Behar districts of West Bengal, before finally joining Brahmaputra near Kurigram district of Bangladesh. Riverbed is made of Boulders and Stones and water

availability is not sufficient for IWT. Discharge is significantly less than minimum 75cusec required for Class-I waterway.

2.5.2.11. **Amo Chhu (Torsa) at Phuentsholing** originates from the Chumbi valley of Tibet where it is called Machu. Its upper reach falls in the territory of Bhutan. It enters Indian Territory near Phuentsholing after travelling about 70 km in China and 78 km in Bhutan. It then flows through the districts of Jalpaiguri and Cooch Behar in West Bengal and joins Brahmaputra in Bangladesh. The length of the river from its origin to Ghughumari (Cooch Behar) is 222 km having a total catchment area of about 4530 Sq.km. Thereafter, it meets Raidak-I. In India it flows for 108 km. Riverbed is made of Boulders and stones and waterflow is not sufficient for IWT. The discharge during Jan, Feb and March is less than 50cusec against the minimum 75cusec required for Class-I waterway.

2.5.2.12. **Wang Chu/Raidak** on the way from Phuntsholing to Lhamoizingkha rises in the Great Himalayan region. Along with its tributaries, it covers a total length of nearly 610 km in Bhutan. The main river is a rapid stream, running over a bed of large boulders. At Tashichho Dzong the bed of the river is about 2,121 m above sea level and at the point of its exit in the Duar its elevation is only 90 m. Riverbed is comprised of boulders and stones and water availability is not sufficient for IWT in Bhutan. The discharge during Jan, Feb, March and April is less than minimum 75cusec required for Class-I waterway. The river is very dynamic and lateral shift occurs.

2.5.2.13. **Sankosh (Punatsang Chu) at Lhamoizingkha** enters West Bengal and joins the Gangadhar river and finally joins Brahmaputra in Bangladesh near Dhubri contributing 2.81 % of the total discharge of the mighty Brahmaputra. The riverbed is made of stones and gravel and water availability is just sufficient for IWT. The discharge is lowest in February at about 150cusec, but has steep gradient in Bhutan with velocity more than 2m/s. The river divides into two near Haldibari and rejoins at Jaraguri. Pre-feasibility stage and river engineering works can confirm its suitability for passengers and tourism as well as cargo.

2.5.2.14. **Mao Khola at Gelephu** originates in the Bhutanese hills and flows southward into the plains of India. Water availability is not sufficient for IWT and the riverbed is comprised of stones and gravel. This is a rainfed river and the discharge is significantly less than minimum 75cusec required for Class-I waterway.

2.5.2.15. **Manas at Panbang** enters into plains of Assam near Mathanguri and flows through Manas reserve forest. At Mathanguri, this river bifurcates into two branches, the eastern branch is known as Beki and western branch is known as Manas. The river Manas meets the river Brahmaputra near Jogighopa. Manas with total catchment area is about 37,500 Sq.km, contributing 5.48 % of the total discharge of Brahmaputra. The riverbed is composed of gravel and silt. It has sufficient volume of water discharge of about 180cusec as compared to required 75cusec. The river has gentle slope and current velocity of about

1.5m/s. It is suitable for IWT passenger transportation and river rafting in Bhutan. The river may be suitable for cargo transportation through NW-2 and IBP after dredging, river training and conservancy works but the river passes through Manas Wildlife Sanctuary etc.

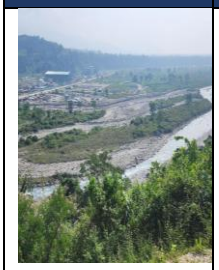
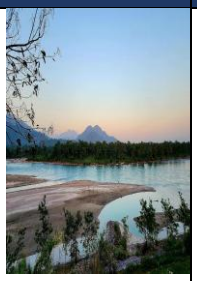
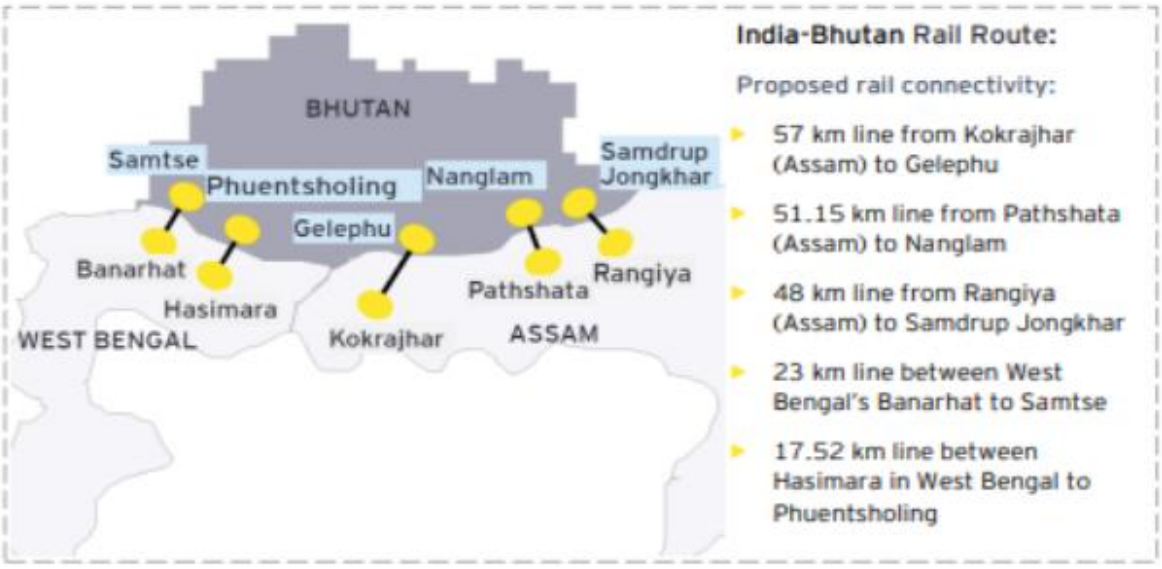
Diana	Amo Chhu (Torsa)	Wang Chhu (Raidak)	Sankosh (Punatsang Chu)	Mao Khola	Manas
					

Figure 8. WB team Conducted scoping assessment in the six rivers of Bhutan

2.5.2.16. Based on the scoping assessment, the team opined that only Sankosh and Manas River systems have water discharge sufficient for development of the fairway channel. The team suggests pre-feasibility and feasibility covering technical, social, environmental and commercial viability aspects. Pre-feasibility stage will cover bathymetric and topographic survey, establish benchmarks and water level, current velocity and discharge measurements, industries data and commercial interest, social and environment concerns and approximate dredge volume for probable different classes of water way. The feasibility study will include bank to bank survey, development of Detailed Project Report and Front-End Engineering Design (FEED) for development of waterway infrastructure suitable for tender. However, the feasibility study should only be undertaken if the pre-feasibility is positive. The time for pre-feasibility stage will be four months and the feasibility study will be at least one year to collect data during both the flood and lean season.

2.5.3. **Railways**

2.5.3.1. Bhutan has no railway connectivity with neighboring countries, nor does it have any internal network. The nearest railheads in India are located at a distance ranging from 16-70 km from the border towns. Recognizing the potential of railway connectivity, a bilateral MoU was signed in January 2005 to study the feasibility of establishing railway links to 5 border towns in Bhutan from the nearest Indian railheads. MOU was signed between the RGoB and Government of India on January 25, 2005, for the following connections (see ***Figure 9***):



Source: Land Customs Station Evaluation Report, Land Ports Authority of India

Figure 9. Proposed Cross-Border Rail Connectivity

2.5.3.2. The 57-km line from Kokrajhar (Assam) to Gelephu (feasibility study ongoing) is considered a potentially viable option. It would connect Bhutan with the Indian and Bangladesh rail networks, the latter via the recently re-established 12km Haldibari-Chilahati link. The reopening of additional railway links between India and Bangladesh has the potential to enhance rail transit for Bhutan. For example, Bangladesh plans to convert the Radhikapur- Birol railway line into a broad gauge and has requested India for a transit link to Bhutan.

2.5.3.3. Bhutan is also considering developing rail connectivity along its southern border. It would run in parallel to the road based SEWH with the goal of linking industrial and manufacturing hubs. Such a southern rail link would likely be an extensive alternative transport mode considering the topography which would require multiple rail bridges. However, shorter rail links between strategic industrial hubs may be financially viable once these hubs have reached a mature stage of development.

2.5.3.4. Priority Railway Routes for Internal Freight and Passenger in Bhutan can be clubbed under three categories-

Phuentsholing to Thimphu:	This route is crucial as Phuentsholing is a major trade gateway with India. Connecting it to the capital, Thimphu, would facilitate the efficient movement of goods and reduce transportation costs.
Gelephu to Thimphu:	Gelephu, another significant border town, can serve as a key logistics hub. A rail link to Thimphu would enhance internal freight distribution.

Samdrup Jongkhar to Trashigang:	This route would connect the eastern regions with the rest of the country, promoting regional trade and development.

Table 11. Priority Rail Routes for Internal Freight

Thimphu to Paro:	Connecting the capital to Paro, which hosts the country's only international airport, would improve accessibility for both residents and tourists
Thimphu to Punakha:	This route would enhance connectivity to Punakha, a significant cultural and historical site, boosting tourism.
Thimphu to Bumthang:	Bumthang is a cultural heartland of Bhutan. A rail link would promote tourism and provide residents with better access to the capital

Table 12. Priority Rail Routes for Passenger Transport

Phuentsholing to Thimphu:	This dual-purpose route would serve both freight and passenger needs, enhancing overall connectivity and economic integration
Gelephu to Thimphu:	Similarly, this route would cater to both freight and passenger transport, supporting regional development and accessibility.

Table 13. Combined Freight and Passenger Rail Routes

Subject to techno-financial feasibility assessment and availability of funding, these priority routes can be designed to maximize economic benefits, improve regional connectivity, and support Bhutan's sustainable development goals.

2.5.3.5. A World Bank scoping mission conducted in November 2024 opined that construction of internal railway routes and provision for domestic passenger transport will not be a financially viable option for Bhutan. The country should focus on developing resilient rail connectivity for freight movement with the neighboring countries. The team suggested had the following observations on the Samtse and Gelephu rail corridors.

2.5.3.6. At **Samtse**, the govt aims to lease plots to clean manufacturing activities such as lumber, furniture manufacturing, and coffee roasting at Dumdum Industrial Park. This is close to completion. The Indian Railway (North-Eastern railway) is developing a DPR for a rail connection from Banarhat to Samtse (23 km line from Banarhat). Main industries to use the railway are likely to be construction materials (stone chips, concrete blocks) and ferro silicate mines in the area east of the industrial park. Loading such materials to rail could create dust and contaminate the clean manufacturing products in the industrial park. A

"concept plan" to create a dry port adjacent to the Industrial Park, but this is not well developed. A number of different locations have been proposed for the railway terminal and the current proposal is to put it along the Damdum Industrial Park and between the industrial park and the proposed dry port. While this location may be suitable for passengers and containerized cargo, the government may want to explore an extension toward the mining area with terminal facilities suited to mining and construction products.

2.5.3.7. At **Gelephu**, the dry port will require dedicated road facilities from the main highway. A railway link to the dry port is also anticipated. The Indian Railway (North-Eastern railway) had completed the feasibility study for a 58 km railway line between Kokrajhar and Gelephu, funded by the government of India. The line is expected to be completed in 2026. These three elements – dry port, road, and rail link need to be laid out in a logical manner, with no conflicts (e.g., train blocking road access) that supports efficiency in logistics and customs processing through the dry port.

2.5.3.8. The scoping mission observed that multiple trade logistics facilities (dry ports, industrial parks), aggregation center and Renewable Natural Resources Centers are being constructed which require careful planning and alignment with multiple modes of transport. Feasibility studies of most of the dry-ports report freight data in values, but for railway and IWT feasibility, freight data in volume is necessary. Industrial parks are yet to yield results and yet to attract private investors. Dry ports are only depending on Cargo Tracking software used by Customs, for a multimodal dry port like Gelephu, an integrated port management system would be key to efficient cargo handling. Internal rail or railway for passengers do not seem a viable option as of now.

2.5.3.9. The scoping mission also indicated that introducing railways to Bhutan means that the Government of Bhutan will need to fulfill the roles of government in railways:

a) Establishing the Railway Industry Structure
b) Purchasing Transport Services
c) Technical and Economic Regulation of the Rail Industry
d) Transnational Railway Agreements and Treaties

At the same time, Government of Bhutan will be overseeing a few short terminal lines, so the level of oversight should be kept as light and simple as possible. For example, Bhutan may choose to hire an operator to operate and maintain its lines. It may choose to adopt RDSO technical standards, which would maintain technical comparability with India.

2.5.4. **Aerial Ropeways**

2.5.4.1. Bhutan, a landlocked nation in the Eastern Himalayas, faces significant challenges in developing and maintaining its transport sector due to its rugged topography, scattered settlements, and fragile ecosystem. Road transport remains the backbone of mobility, yet its expansion is constrained by steep terrains, high construction and maintenance costs,

and frequent disruptions caused by landslides and extreme weather. As of 2024, the country's total road network stands at 18,270.83 km[6], but many remote villages continue to remain inaccessible, limiting economic opportunities and access to essential services.

2.5.4.2. Public transport is gradually expanding, with the number of registered buses increasing from 990 in 2023[7], to 1,228 in July 2025[8], reflecting rising travel demand. Similarly, Bhutan's tourism sector, which recorded 144,793 international arrivals in 2024[9], continues to exert pressure on existing road networks, particularly in urban centers and popular tourist destinations. These trends underscore the growing limitations of a road-based transport system in adequately meeting mobility needs. Moreover, road construction in Bhutan's delicate mountain ecosystem raises pressing environmental concerns.

2.5.4.3. Given these challenges, it is imperative to explore sustainable alternatives that can complement road transport while enhancing connectivity to remote regions. Aerial ropeways and cable cars present a promising solution, offering reduced environmental impact, lower costs in difficult terrain, and greater safety compared to conventional roads. Ropeways are particularly suited for steep slopes and villages with poor road access, while cable cars hold strong potential in areas of tourism and pilgrimage interest.

2.5.4.4. Bhutan has some historical experience with ropeway systems, notably the 7 km ropeway in Tashila, Wangduephodrang, constructed between 1980–1983 with Swiss assistance, which was used for transporting timber and local produce until it ceased operation around 2015/2016. Despite their potential, further development of ropeways in Bhutan has been hindered by high investment costs, limited funding, dependence on imported equipment and spare parts, and the lack of local technical expertise

2.5.4.5. Recognizing their importance, the Cabinet in 2013 directed the Ministry of Information and Communications to prepare a ropeway master plan in coordination with other ministries, though this has yet to be realized. Earlier, the Surface Transport Master Plan (2007) had already identified several potential ropeway sites across the country, primarily for pilgrims, tourists, and local communities without road access. While some sites may no longer be relevant due to road expansion, the need for a comprehensive feasibility study remains critical.

2.5.4.6. This study seeks to assess the feasibility and potential benefits of introducing aerial ropeways in Bhutan as a complementary mode of transport. By carefully evaluating travel demand, technical and financial viability, environmental considerations, and institutional arrangements, the assessment aims to inform policies and investments that align with

[6] Statistical Year Book of Bhutan 2025

[7] Annual Report 2022-2023, BCTA

[8] Vehicle Registration Statistics for the Month of July 2025, BCTA

[9] Statistical Year Book of Bhutan 2025

Bhutan's sustainable development goals, promote equitable access, and enhance connectivity for both people and goods.

2.5.5. **Civil Aviation**

2.5.5.1. Civil aviation is essential for Bhutan's growth as it provides vital support to the development of tourism, trade and manufacturing. Bhutan currently has one international airport (Paro) and three domestic airports (Yongphulla, Bathpalathang, and Gelephu). Due to difficult terrain and weather conditions, air navigation and airport development and operation in the country present unique challenges. Paro International Airport (PIA) is located in a deep valley (Paro valley) about 65 kilometers by road from Thimphu. The surrounding hills rise as high as 4,800 meters, high winds at certain times of the year restrict aircraft operations to early in the day, and difficult and hazardous approaches into PIA must be operated entirely visually. Aircraft operations at PIA are limited during the windy months to half-day operations, and sometimes restricted to periods of 4–6 hours. This seriously limits PIA capacity and the number of passengers who can fly in and out of the country at those times of the year. The three domestic airports have similar challenges, and the current facilities are basic and only for initial air operation and passenger accommodation. Constrained by limited operational hours, the PIA runway's peak capacity is seven aircraft movements per hour. Under this scenario and with annual passengers estimated to reach over 900,000 by 2030, passenger volume will exceed the PIA's ultimate capacity by 2033[10].

2.5.5.2. The Government is exploring to upgrade Gelephu to an international airport and as an alternate airport in case of an emergency. Gelephu is located in southern Bhutan, about 30 kilometers east of Sarpang, the district (dzongkhag) headquarters. Because of its flat terrain and topographical conditions, Gelephu's domestic airport is considered the most feasible for potential upgrade and for operating as an alternate international airport to PIA. In order to accommodate bigger aircraft (e.g., A-320), the extension of the runway of 500m is necessary and would entail slope correction, construction of culvert over the river, river protection/drainage, and navigation/ancillary facilities (preliminary cost estimate of $91m). In 2021, the ADB undertook a preliminary study to develop a new runway of 4,000m near the existing runway (preliminary cost estimate of $350m). The government's objective is for the new Gelephu international airport to also service passengers and air freight demand in India's northeastern states.

2.5.5.3. Two airlines operate out of Bhutan: Druk Air (state-owned carrier) and Bhutan Airlines (a newer and small private carrier). Druk Air is a well-established, 40-year-old airline with mature management systems and stable operating characteristics while Bhutan Airlines is ten years old and has been pursuing a cautious, slow-growth strategy as it probes the industry and develops new markets. Pre-COVID-19, Druk Air serviced the majority (over

[10] ADB. 2019. Kingdom of Bhutan: Enhancing Aviation Sector Development Capacity.

65%) of passenger travel demand, servicing five countries, while Bhutan Airlines served three countries. Air cargo is currently being carried by passenger flights, but DoAT is planning to establish dedicated air cargo services by Druk Air.

2.6. **Regional Transit**

2.6.1. Bhutan is dependent on transit traffic through India for access to seaports. The Phuentsholing-Kolkata/ Haldia corridor carries the most regular and substantial freight flows. While there are no formal restrictions on Bhutanese trucks carrying cargo to India, Indian cargo bound for Bhutan is often trans-shipped at the border town onto smaller six-to-eight-ton Bhutanese trucks more suitable for the narrow and mountainous Bhutanese roads.

2.6.2. A regional corridor study by the World Bank found several challenges and inefficiencies along the Phuentsholing-Kolkata/ Haldia corridor. It is hampered by operational delays in the port of Kolkata, lengthy clearance procedures, and frequent strikes and road blockages enroute. Bhutanese truckers are reported to be subjected to informal payments and harassment and road and port-based informal payments are common. Trucks are frequently overloaded, and many operators prefer to ply at night or take informal routes to avoid penalties for overloading, leading to longer travel times. The study found that on average, an export shipment from India stays two days at Jaigaon before crossing to Phuentsholing, of which one day is spent at the roadside or private parking, and one day inside border check post. Time through the border is markedly higher for importing into Bhutan with more time needed for security, customs checks, and goods handling (see ***table below***).

Activity	Kolkata/Jaigaon		Phuentsholing/Thimphu	
	Export	*Import*	*Export*	*Import*
Average time at border town, of which:	2 days	n.a.	8.5 hours	9.5 hours
Idle time before entering port	1 day	n.a.	5 hours	3.5 hours
Time at the border check post, including:	1 day	n.a.	3.5 hours	6 hours
Security/Admin inspection	2 hours	2 hours	2 hours	4.25 hours
Weighing time (including queue)	2 hours	2 hours	2 hours	2 hours.
Physical inspection (when applicable)	7 hours	7 hours	3 hours	3 hours
Phytosanitary inspection (when applicable)	-	2 hours	3 hours	2.5 hours.
Unloading	n.a.	n.a.	2 hours.	2 hours
Loading	n.a.	n.a.	2 hours	5.5 hours
Transport time	3 days		6 hours.	
Distance	706 km		147 km	

Table 14. EXIM Time Kolkata/Thimphu Road Corridor

2.6.3. The study found that it costs approximately US$ 726 to move a shipment of 15 metric tons from Kolkata to Phuentsholing in an open truck. For a container truck loaded with 7 metric tons, it costs approximately US$628. There are six or seven tolls in this route that amount to approximately US$33. Informal payments made at police stops amount to US$28. Bhutan's transport sector also has relatively high fixed costs with fuel contributing up to 50 percent of

operating costs. As a result of the unavailability of return loads and up to 80 percent of trucks returning empty to Kolkata - transport prices tend to be high while international service providers are not attracted to the domestic market. Adding to the cost of trade, the Government of West Bengal has recently instituted an online portal (e-Suvidha) for facilitation of cross-border movement of freight through land borders, under which Bhutanese exporters are required to pay a fee.

2.6.4. Freight traffic between Bhutan and Bangladesh moves mainly along the Phuentsholing/Jaigaon-Chengrahandha/Burimari (115 kms) corridor. This corridor suffers from poor equipment, warehousing facilities, and a lack of electricity at the Burimari land port[11]. Traders also report frequent local disturbances and are often requested to make informal payments. Fresh and perishable commodities, fruits and vegetables in particular, exported to Bangladesh face the risk of damage in the absence of suitable logistics facilities. It is expected that some of the current transit challenges, including transshipments, will be eased when the Bhutan-Bangladesh transit agreement becomes effective.

2.7. **Transport Services**

2.7.1. Transport is the most important component of logistics services in Bhutan. Other logistics services, such as storage, handling, loading, and inventory holding have largely not been developed. Transport issues are considered a high constraint by Bhutanese business; 17 percent of the companies depending on imports consider transport to be the main constraint for investment[12].

2.7.2. The goods transport sector is completely operated by private operators. Unlike passenger transport, the Government does not have any direct control on freight, which is determined by the market forces on cost-recovery method adopting round-trip concept. In other words, the level of empty returns plays a major impact in freight negotiation between traders.

2.7.3. The transport industry is fragmented and dominated by small owner-operators[13]. There exist only few transport companies with more than 20 trucks. There are currently around 9,000 trucks of varying size registered in Bhutan, of which almost 90 percent operate within or between Thimphu and Phuentsholing. Most of the fleet registered in Bhutan consists of 2-axle trucks that can carry a maximum load of 10 tons. Bhutanese companies usually contract external transport services. Only two warehousing companies use their own trucks for delivery and transport services. See *table below*. Large manufacturers and traders arrange transport and clearance services themselves and do not use the services of a logistics service provider. While the demand has grown, the transport and logistics industry has not developed accordingly and is unable to provide high-quality services.

[11] The Burimari land port will be upgraded under the ACCESS program – Bangladesh Phase 1 project

[12] UNDP, Diagnostic Trade Integration Strategy Update 2021

[13] IBID

PVT/ GOVT	HEAVY	MEDIUM	LIGHT	TWO WHEELER	TAXI	PASSENGER TRANSPORT	TRACTOR	EARTH MOVING EQUIP	ELECTRIC VEHICLE	TOTAL
Private	10,937	1,645	68,098	10,021	2,441	365	3,049	93	5,588	102,237
Govt	1,323	290	3,008	1,482		705	137	379	34	7,358
Total	12,260	1,935	71,106	11,503	2,441	1,070	3,186	472	5,622	109,595

Source: Statistical Handbook of Bhutan 2021

Table 15. Number of Vehicles Registered in Bhutan (June 2020)

3. ANNEXURE III: TRADE FACILITATION ASSESSMENT

The following sections provide an overview of Bhutan's trade facilitation performance, including inter-agency coordination, customs, Non-Tariff Measures (NTMs), and trade-enabling infrastructure. This information also feeds into the development of the Multimodal Transport and Trade Logistics Master Plan set out in Section 7. of this ToR.

The trade-related agencies in Bhutan are the Department of Trade (DoT), Ministry of Industry, Commerce, and Employment (MoICE), Department of Revenue and Customs (DRC), Ministry of Finance (MoF), Ministry of Foreign Affairs and External Trade (MoFAET), Royal Monetary Authority (RMA), and several agencies under the Ministry of Agriculture and Livestock (MoAL). GovTech is also a critical player given its mandate to consolidate digital systems and data related to trade.

3.1. Inter-Agency Coordination

3.1.1. Trade facilitation in Bhutan has been hampered by multiple agencies imposing various requirements that often overlap and multi-agency controls at entry points that result in legal uncertainty. There is a lack of coordination and cooperation among the various stakeholders involved in trade. There is an expectation that Bhutan's 2022 civil service reform will help improve trade agency cooperation. Bhutan has established the National Trade Facilitation Committee (NTFC) with a mandate to bring together all key government and private agencies involved in trade and transport. According to the DTIS update, the NTFC's performance has been modest given its placement under the DRC primarily for steering the enactment of the Customs Act of Bhutan 2017 and the customs automation process. However, the committee's position and authority remain unclear as there is no binding legal requirement for participation under any legislation. A World Bank study found that that there is a lack of awareness of the benefits, lack of commitment from government agencies to engage with the private sector (participation of members being restricted largely to mere attendance of meetings), inadequate resources (financial and human), and limited monitoring and evaluating mechanisms to measure results.

3.2. Customs

3.2.1. Bhutan has initiated a process of revising laws and regulations that are aligned with the RKC. Measures that are being considered include (i) harmonization of customs documentation, procedures, and formalities through bilateral and regional initiatives; (ii)

pre-shipment customs clearance facilities; (iii) Computerized security checks and quarantine facilities; and participation in the UNESCAP Framework Agreement for Paperless Trade. Customs modernization initiatives have contributed to Bhutan's significantly improved ranking on the 2023 World Bank's Logistics Performance Index (LPI) – from 151 (out of 167) in 2018 to 97 (out of 138). The improved ranking primarily reflects enhanced customs performance (ranked #65). It scored relatively weaker on the indices for infrastructure (#118), international shipments (#121) and tracking and tracing (#117).

3.2.2. The DRC has developed a web-based customs system, titled Electronic Customs Management System (eCMS). This system has replaced the stand-alone system known as the Bhutan Automated Customs System (BACS). Once fully operational, the eCMS will have the capacity for online declaration, online payments, advance declaration, risk management and reporting functions. The eCMS interfaces with the Revenue Administration Management and Information System (RAMIS).

3.2.3. The RMA has initiated (January 2021) the development of an integrated cross-border trade and financial transaction system, titled the Bhutan TradeFin Net (BTFN). The BTFN will consolidate and strengthen cross-border trade and financial transactions and will integrate with the eCMS, Banking system, and Government to Citizens (G2C) portal. It will streamline trade procedures, automate existing manual-based procedures, thereby benefiting both traders and the government in terms of reduction of trade transaction cost, improvement in compliance and enhancing ease of doing business as follow. The ongoing Phase I of the BTFN includes i) Registration of Traders (importers & exporters); ii) Approval of import/export licenses/permit/certificates; iii) Application for letter of credit (LC)/RTGS/TT and its approval for payments and receipts for trade; iv) tracking trade flows throughout the trade cycle with a certain degree of risk assessment; v) and functionality to allow business users for services-related trade and any other international payments and receipts related to trade in goods and services, remittances, capital & financial flows to help RMA to track and record inward receipts and outward payments other than goods. Subsequent development phases (2 and 3) of the BTFN will incorporate and integrate with other key stakeholders of cross-border trade such as immigration, labor, tourism, agriculture, and health.

3.2.4. Bhutan has explored the development of a National Single Window (NSW) for Trade for over a decade. A feasibility study was conducted by the ADB in 2016 to determine the impact of an NSW Bhutan's trade facilitation environment and trading community. Further, the DTIS argued that the NSW is a logical steppingstone after the launch of the eCMS and BTFN. A Bhutan NSW would bring together existing certificate, license and permit issuing services under one platform. It would also develop relevant back-end operations as deemed necessary by the concerned ministries and agencies for an end-to-end service solution for the businesses and traders. As part of the ACCESS Bhutan project, National Single Window for trade will be developed connecting all certificate, licensing and permit issuing agencies.

3.2.5. The Department of Trade has developed (2020) a Trade Information Portal (www.bhutantradeportal.bt). The portal primarily provides trade information on how to

export Bhutanese products and information about Bhutanese products and services. However, the Portal needs further development in order to comply with the requirements of the TFA.

3.2.6. As Bhutan is taking positive steps towards paperless trade, it would be important for the government to also ensure more affordable, reliable, and resilient Internet and data infrastructure. While 88 percent of the Bhutan's population have access to Internet with 17 Mbps bandwidth, the cost per bandwidth is almost double in Bhutan as opposed to other comparator countries. The performance of Bhutan's digital systems is also undermined by poor data governance and interoperability, weak digital safeguards and institutional and legal environment to support secure cross-border data flow, and insufficient digital capabilities.

3.3. Non-Tariff Measures (NTMs)

3.3.1. Non-tariff measures (NTMs) are key barriers to Bhutan's trade performance. As Bhutan's trade has become formalized exports are more impacted by Sanitary and Phytosanitary (SPS) measures and technical barriers to trade (TBT) on food and agricultural goods.

3.3.2. The Bhutan Agriculture and Food Regulatory Authority (BAFRA) is the certifying body in the country. It is responsible for drafting standards by the Bhutan Standards Bureau (BSB), the testing by the National Food Testing Laboratory (NFTL) and plant quarantine stations and the issuance of sanitary and phytosanitary, weight and quality certificates for import and export. BSB is the lead agency tasked with overseeing compliance and certification in line with industry standards and requirements. The NFTL, located in Yusiphang, Thimphu is the designated lab for SPS compliance.

3.3.3. The NFTL's capacity is limited to basic testing parameters, due to lack of sophisticated testing equipment and trained staff. Most tests for export certificates are therefore outsourced to India and Thailand, incurring high costs and delays. The Food Safety and Security Authority of India (FSSAI) initiated in 2018 recognition of the NFTL for analysis of food samples under India's Food Safety and Standards Regulations, requiring food import authorities in India to accept test analysis certificates issued by the NFTL. However, India does not acknowledge the test certificates for processed food, cardamom and pepper, and recognition of certification for certain products such as fruit juices is often delayed. Authorities or importers in India often require a "fit for human consumption" certificate or test results issued by reputed institutes in India. The nearest FSSAI accredited lab is in Kolkata which can lead to delays of up to 10 days. Bangladesh requires separate certificate sheets for each tested residue or contamination parameter.

3.3.4. Similarly, the availability of TBT-related laboratories and equipment remains limited in Bhutan. Testing facilities do not yet have international accreditation BSB has recognized the need to demonstrate equivalency with other countries' certification schemes, and to secure recognition of the BSB certification scheme by its trade partners, especially SAARC countries. The BSB is therefore working to achieve international accreditation for its product certification.

3.4. Border Crossings and Trade Enabling Infrastructure

3.4.1. Bhutan's trade passes through 16 land border crossing posts shared with India. Phuentsholing, Samtse, Gelephu and Samdrup Jongkhar are the most significant in terms of trade volumes. These crossing points share borders with the Indian states of Assam and West Bengal. The same border-crossing points and road corridors are also used for trade with Bangladesh and Nepal. Phuentsholing handles the majority of the trade in terms of value and volume (76 percent of its total trade). Hence, the efficiency of this border post is critical to the efficiency of the overall trade logistics system. The Royal Bhutan Police (RMA) has the overall responsibility for managing border operations, including, inter alia, the functions of customs, testing, security, and freight handling.

3.4.2. Bhutan's trade gateways lack adequate capacity. Border facilities, particularly at Phuentsholing, cannot accommodate the current traffic demand, and as a result, suffers from traffic congestion. Bhutan's 2023 LPI ranking for infrastructure (#118) gives an indication of the inadequate state of its border and transit infrastructure. There is a lack of logistics infrastructure such as warehouses, unloading and loading areas, dedicated equipment such as containers, and professional handling services. Delays frequently occur in processing at the border crossings, e.g., due to nonavailability of international banking facilities on the Bhutanese side forces traders to travel to other parts to process simple banking transactions.

3.4.3. Bhutan has made strides in developing a network of inland container depots (ICDs). A mini-ICD at Phuentsholing with 10,385 TEUs per annum became operational in 2020 and has eased some constraints and pressures. The ICD is equipped with the necessary cargo handling and storage facilities under customs control, with associated capabilities for clearing and forwarding goods, warehousing, trans-shipment and transit. An ICD at Pasakha was completed in 2022 and will further ease constraints as exports and imports to the Pasakha Industrial Estate do not need to pass through Phuentsholing. Bhutan has also developed a 60-acre area dry port at Samtse (2020), for export of stone for construction to Bangladesh through India. Similar facilities have been planned at Gelephu, Nanglam, and other border areas.

3.4.4. The development of these terminals and the proposed rail connectivity will promote international trade and the networks of terminals will also promote multimodal transport. This will facilitate container traffic from the ports of India. Containerization is still at a very low level in Bhutan. Currently, most containers that enter Bhutan with imported merchandise from third countries return empty to the port of Kolkata. Shipping lines allow only 14 days for the use of containers on inland transport. Once this time has passed, demurrage fees must be paid. In Bhutan, exports of goods are often not readily available in sufficient volume, and for this reason most of the containers return empty. Consequently, containers for export must be re-imported with the costs for the importation borne by the exporter.

4. ANNEXURE IV: AGRI-TRADE

The agricultural sector provided employment opportunities to 43.5% of the total labor force (LFS, 2022) and contributed to 10.5% of the GDP in 2020 (National Accounts Statistics 2022). While ensuring food and nutrition security, the primary sector (Agriculture, Forestry and Livestock) in Bhutan recorded growth of 2.1% and contributed 19.2% to the economy in 2021. Overall Bhutan is a net importer of agricultural produce. Imports, valued at Nu 11.6 billion, are 2.7 times the exports, which are valued at Nu 4.3 billion.

4.1. Bhutan's exports and imports are concentrated to a few key trade partners. India (75 percent) followed by Bangladesh (20 percent) account for 95 percent of all exports from Bhutan. When considering export of agricultural commodities, India's share is 67 percent. On the import side, Bhutan's reliance on India is more than 80 percent, and 91 percent for import of agricultural commodities. Market access is critical for harnessing the potential benefit of agriculture for economic development.

4.2. Cardamoms, citrus and potatoes are the main export commodities in Bhutan as well as beverages, spirits and vinegar and preparations of vegetables, fruit, nuts or other parts of plants. Areas of production vary depending on the crop. Temperate crops like potato are grown in the higher valleys like Gangtey/Phobjika and Bumthang during summer and in the lower valleys during winter. Subtropical perennial crops like mandarins, kiwi and avocado are grown in the mid to lower altitude valleys, e.g., in Dagana and Pemagatshel. The main import and export hub is the Phuentsholing-Jaigoan border towns, connecting the capital Thimphu to India. Trade routes from the production zones in Haa, Paro, Wangduephodrang, Punakha go via Phuentsholing, from which Products from Pemagatshel, Tashigang, Tashiyangtse and Mongar are exported via Samdruk Jongkhar in the East. Recently, also the Gelephu – Hathisar border post is increasing in importance, from which products from Zhemgang are exported. Products from Bumthang (Jakar) and Tongsa may go either through Gelephu or Phuentsholing. Mandarins from Dagana may be exported directly from Sarpang, but most go through Gelephu or, via transit through India, from Phuentsholing. Finally, a small quantity of products (including mandarins and ginger) is exported from Samtse and Bhutan intends to develop border infrastructure at Nganglam.

4.3. Lack of proper transportation and cold storage facilities discourage agro-entrepreneurs to explore market opportunities later in the season and leads to a substantial loss of fresh products. To address these logistical issues, the government is seeking investment in domestic and border infrastructure to facilitate agricultural trade. To facilitate agricultural trade, the government is planning to establish several physical renewable natural resource hubs to aggregate niche (Paro) or bulky commodities (Gelephu) at strategic location, provide some value addition services (washing, treatment, packaging), and facilitate export via air (Paro) or train/truck (Gelephu) cargo. In other border town, the government is

planning to establish export facilitation centers, which offer basic infrastructure for grading, packaging, and shipping.

4.4. However, agricultural support services remain rudimental and are not tailored towards the post-harvest and marketing services needed to add value to raw products, clearly brand and label products, and tap into high-value markets. Post-harvesting handling services for fresh produce are not available at source and more advanced fresh product treatment machinery (e.g., hot water, vapor heat, or radiation treatment). Instead, temporary structures are used during the season, reducing the quality of grading and sorting. Similarly, agro-entrepreneurs that want to sell branded products lack access to packaging and branding services. Finally, the BFDA and its central and satellite labs lack advanced facilities and technical competence necessary to provide a comprehensive range of testing and certification services required for product exports. Food testing services are outdated, understaffed and not precise or specific enough (e.g. Bhutan has no lab facilities to test for formalin).

4.5. Recognition of BFDA certification can be delayed for certain products of exports such as ultra-high temperature milk and fruit juices. Importers require test results from recognized institutions such as the FSSAI. Similarly, for export of cardamom to India, SPS certification issued by BFDA is not acknowledged without the need for detailed additional information. Authorities in India often require a "fit for human consumption" certificate issued by reputed institutes in India. The closest of these is in Kolkata, which can lead to delays of up to 10 days and extra costs. Similar problems exist for all fruit products exported to Bangladesh, where importers require formalin-free test results and nonradioactive test results. With no testing facilities in Bhutan, samples are sent to India (Mumbai) and Thailand, incurring long delays and extra cost.

4.6. Most importantly, the production facilities, given its distance from the capital, struggle for competitive sourcing of quality inputs (seeds, micronutrients, organic fertilizers, necessary facilities for soil testing, organic farming, appropriate use of pesticide suitable for organic farming), without which ensuring sustainable supply of agro-export produces will be uncertain.

5. ANNEXURE V: CLIMATE RESILIENCE

5.1. Climate change is a major challenge for Bhutan. Bhutan is very susceptible to multiple natural hazards such as floods, heavy rainfall, landslides, earthquakes, glacial lake outburst floods (GLOF), forest fires and droughts. Due to the country's rainfall patterns, terrain slope, geology, soil and land cover and seismic conditions, Bhutan is very susceptible to landslides. Most occur in the eastern and southern foothill belt where the terrain is steep and rocks underlying the soil cover are highly fractured, allowing easy seepage of water. Landslides most commonly occur during or towards the end of the monsoon season, from May to September.

5.2. Floods and landslides pose major threats to people's lives, assets, and infrastructure every monsoon season. For example, the floods of 2016 washed away settlements in the southern parts of the country, destroyed critical infrastructure including roads and bridges, cutting away the upper parts of the country from food and fuel supply. Further, the critical economic corridor between Phuentsholing and Thimphu is frequently subjected to landslides, leading to road closure for up to eight days each year.

5.3. The need for sustainable, green, and resilient transport services is critical. Bhutan has an overall high road and bridges' vulnerability due to topography, climate and seismic activity. There is a lack of bypass or alternative roads, making the road network non-redundant. The Governments therefore need to improve resilience planning practices at the network level; develop hydrometeorological information infrastructure, basic public weather services, forecasting, and multi-hazard early warning systems; and make infrastructure assets resilient and green. The incremental cost of making infrastructure investments resilient is as low as about 3 percent of overall infrastructure investment needs. Currently, Bhutan has a yearly expense of US$3.47 million associated with monsoon restoration works (US$190 per km).