Country Paper Presentation on “Enhancing Rural Transport Connectivity to Regional and International Transport Networks”

Country: Bangladesh

Presented By
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Bangladesh – At a Glance

- **Area** – 147,500 sq. km
- **Population** – 160 Million
- **Location** - The West, North & North East Portion – India, The South East Portion – India, The South Portion – Myanmar; The South Portion – Bay of Bengal
- **Capital** – Dhaka
- **Language** – Bangla
- **Currency** – Bangladesh Taka (BDT)
- **Main Rivers** – Padma, Brahmaputra, Jamuna and Meghna
- **Temperature** – 7°C to 22°C in winter and 23°C to 38°C in Summer
- **Average Rainfall** – 1429 to 4338 mm annually
Background of Rural Transport Connectivity in Bangladesh

- From the ancient times, water transport was the main transport mode for long distance.
- Horse/Bullock-carts for short distance.
- Rail Network developed in the British period
- Development of a wide spread road network up to rural level was first felt in 1957
- The widespread development of road sector of Bangladesh started after independence in 1971
- Roads gradually replaces waterways
- Countrywide planned construction of rural roads started in Mid 80s through GCCRs.
Background of Rural Transport Connectivity in Bangladesh

The transport system of Bangladesh consists of roads, railways, waterways & airways by six ministries:

- The road network is managed by two ministries; RHD under MORTB and LGED/LGIs under MOLGRDC
- Railways by the Ministry of Railways
- Inland waterways and maritime shipping facilities by the Ministry of Shipping (BIWTA & BSC)
- Airways by the Ministry of Civil Aviation and Tourism (CAA).
## Rural Road Network

Table: LGED Rural Road Network

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Number of Road</th>
<th>Total Length (km)</th>
<th>Paved/Improved Length</th>
<th>% Improved/Paved</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upazila Road</td>
<td>4781</td>
<td>37519</td>
<td>33987</td>
<td>90.58</td>
<td></td>
</tr>
<tr>
<td>Union Road</td>
<td>8023</td>
<td>41680</td>
<td>30517</td>
<td>73.21</td>
<td></td>
</tr>
<tr>
<td>Village Road - Type A</td>
<td>47869</td>
<td>127427</td>
<td>32766</td>
<td>25.71</td>
<td></td>
</tr>
<tr>
<td>Village Road - Type B</td>
<td>90004</td>
<td>146317</td>
<td>15940</td>
<td>10.89</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>150677</td>
<td>352943</td>
<td>113210</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: LGED RSDMS 2018
Changing Role of Rural Transport Connectivity in Rural Development of Bangladesh

- Rural Bangladesh is changing its face socially, economically, physically and structurally.
- Signs of urbanization along rural roads and around GCMs.
- Rural road development projects created opportunities for economic growth and poverty reduction.
- Private investments in shops, restaurants, pharmacies, tea stalls, saloon and other farm & non-farm activities created employment opportunities.
- Access to markets and welfare institutions like hospitals, schools, LGI offices etc. for total socio-economic upliftment of people.
- Movement/migration of labours not only in lean period but also for the whole year.
- Expanded connectivity between rural and urban areas has also increased the value of land significantly.
- As rural roads developed so quickly in last three decades, road density of Bangladesh significantly increases.
Changing Role of Rural Transport Connectivity in Rural Development of Bangladesh

Figure - Road Density (kilometers of roads per thousand square kilometers of land area)

Source: ADB (2018)
Connectivity Towards to Regional and International Networks

Bangladesh is actively involved in different regional and international connectivity initiatives namely

- Asian Highway Network
- South Asia Sub regional Economic Cooperation (SASEC) Corridors
- Bangladesh-China-India-Myanmar Economic Corridor (BCIM-EC)
- Bay of Bengal Initiatives for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Corridor
- South Asian Association for Regional Cooperation (SAARC) Corridor
- Bangladesh Bhutan India Nepal Motor Vehicles Agreement (BBIN MVA)
- Protocol on Inland Water Transit and Trade (PIWTT)
- Border Haats MoU between India and Bangladesh
National Strategies for Rural Transport Connectivity

- One Major Component of the ‘Comilla Model’ by Dr Akhtar Hameed Khan, the founder Director of BARD is Roads & Drainage Structures evolved in 60s and consequently LGED was created.

- The ‘Rural Development Strategy 1984’ was the first strategic document regarding planning and prioritization of the rural roads in Bangladesh

- The Government of Bangladesh, through its Gazette Notification (November 2003) for Road Classifications.

- The following plans and strategies that are also guiding tools to formulate projects and programs on development of rural transport connectivity
  - Sustainable Development Goals (SDGs)
  - Bangladesh Delta Plan 2100
  - Bangladesh Perspective Plan 2010-2021/Vision 2021 & 2041
  - Five Year Plan
  - National Multi-Modal Transport Policy
  - Election Manifesto of the Ruling Government 2018
  - Country Strategies of different development partners
National Strategies

Achieving Goals

LOCAL GOVERNMENT ENGINEERING DEPARTMENT
Local Government Division
Ministry of Local Government, Rural Development & Cooperatives

7th FIVE YEAR PLAN
FY2016 - FY2020

SUSTAINABLE DEVELOPMENT GOALS

# National Strategies: Ownership of Roads

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Types</th>
<th>Definition</th>
<th>Ownership and Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Highway</td>
<td>Highways connecting National capital with Divisional HQ/s or seaports or land ports or Asian Highway.</td>
<td>MRTHD/RHD</td>
</tr>
<tr>
<td>2</td>
<td>Regional Highway</td>
<td>Highways connecting District HQ/s or main river or land ports or with each other not connected by National Highways.</td>
<td>MRTHD/RHD</td>
</tr>
<tr>
<td>3</td>
<td>Zila Road</td>
<td>Roads connecting District HQ/s with Upazila HQ/s or connecting one Upazila HQ to another Upazila HQ by a single main connection with National/Regional Highway, through shortest distance/route.</td>
<td>MRTHD/RHD</td>
</tr>
<tr>
<td>4</td>
<td>Upazila Road</td>
<td>Roads connecting Upazila HQ/s with Growth Center/s or one Growth Center with another Growth Center by a single main connection or connecting Growth Center to Higher Road System**, through shortest distance/route</td>
<td>LGED/LGI*</td>
</tr>
<tr>
<td>5</td>
<td>Union Road</td>
<td>Roads connecting Union HQ/s with Upazila HQs, growth centers or local markets or with each other.</td>
<td>LGED/LGI</td>
</tr>
<tr>
<td>6</td>
<td>Village Road</td>
<td>(a) Roads connecting Villages with Union HQs, local markets, farms and ghats or with each other.</td>
<td>LGED/LGI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(a) Roads within a Village.</td>
<td></td>
</tr>
</tbody>
</table>

Source: Bangladesh Gazette 1st Part, 6 November 2003
Annual Development Budget for Rural Transport (Billion in BDT)
Rural Road Maintenance Regimes

- Huge Assets of rural transport created in 3 decades only.
- Rural roads of 113,200 Km and every year another 6000 km roads being added to this network.
- First maintenance fund for rural roads was allocated from the non-development budget in the FY:1992-93.
- Big gap between fund available and actual demands.
- The “Rural Road and Bridge Maintenance Policy, 2013” was formulated.
- Provision of maintenance financing in development projects for Backlog Maintenance, Rehabilitation and Upgradation to Geometric Standards; Financing by Local Government Institutions; and Financing by Private Sector in the Maintenance Policy.
LGED undertakes four types of maintenance. Those are – (i) **Regular Routine Maintenance** (ii) **Periodic Maintenance** (iii) **Emergency Maintenance** and (iv) **Rehabilitation**

For the FY: 2019-20, the Road Maintenance Allocation for Rural Transport is **20.10 Billion BDT/USD 250 Million**.

**RSDMS Database** for comprehensive road and appurtenant structure inventory for planning and programming of maintenance work.

The road network is assessed by Rapid Road Condition Survey (RRCS) to enable preparation of annual maintenance need and to find out the International Roughness Index (IRI).

The deflection test is to determine the pavement strengths in order to decide the type of maintenance/rehabilitation. Both **Benkelmen Beam Test** and **Falling Weight Deflectometer** are two procedures used in LGED to determine the pavement strength.
### Annual Maintenance Needs Assessment

#### Conduct Roughness Survey

- Compilation of Data

#### Analyzing & Rating Condition

- Obtain Surface Condition of Road Network

#### IRI Range and Condition Rating

<table>
<thead>
<tr>
<th>IRI Range</th>
<th>Condition Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 6</td>
<td>Good</td>
</tr>
<tr>
<td>6 to 8</td>
<td>Fair</td>
</tr>
<tr>
<td>8 to 10</td>
<td>Poor</td>
</tr>
<tr>
<td>More than 10</td>
<td>Bad</td>
</tr>
</tbody>
</table>

#### Annual Maintenance Needs Assessment

- Obtain Surface Condition of Road Network

<table>
<thead>
<tr>
<th>Good Length</th>
<th>Fair Length</th>
<th>Poor Length</th>
<th>Bad Length</th>
</tr>
</thead>
</table>

17-Jul-19

Road Maintenance and Road Safety Unit (RMRSU), LGED, H/Q, Dhaka
Annual Maintenance Needs Assessment

- Cost of RM (Off Pavement)
- Cost of RM (On Pavement)
- Cost of PM (Re-Sealing)
- Cost of PM (Overlaying)
- Cost of Rehabilitation
- Cost of Bridge/Culvert Maint.
**District-Wise Weightage Calculation for Maint. Allocation**

### Road Parameter

[A] % of Paved (BC & Rigid) Length of UZR & UNR of a District w.r.t Country Total

[B] % Vehicle km of Paved (BC & Rigid) Length of UZR & UNR of a District w.r.t Country Total

[C] % Socio-Econ. Point Total of Paved (BC & Rigid) Length of UZR & UNR of a District w.r.t Country Total

[D] Weightage % (A+B+C)/3

### Condition & Cost Parameter

[E] Repair Cost for Fair Length of Paved (BC & Rigid) of UZR & UNR of a District

[F] Repair Cost for Poor Length of Paved (BC & Rigid) of UZR & UNR of a District

[G] Repair Cost for Bad Length of Paved (BC & Rigid) of UZR & UNR of a District

[H] Repair Cost for Damaged B/C on Paved (BC & Rigid) of UZR & UNR of a District

[I] Total Repair cost of a District (E+F+G+H)

[J] Weightage % I/Sum of I

**District Weightage**

(D+J)/2

Link to make Relative Weightage
Rural Road Maintenance Regimes (Cont.)

Road Maintenance Allocation (Billion BDT)

- 2010-11: 6.058
- 2011-12: 6.387
- 2012-13: 7.74
- 2013-14: 8.158
- 2014-15: 9.92
- 2015-16: 10.25
- 2016-17: 12.75
- 2017-18: 17.35
- 2018-19: 17.72
- 2019-20: 20.1

Source: LGED Maintenance Unit

Figure - Road Maintenance Allocation (Billion BDT)
Linking national and local road networks to reap the benefits of connectivity

- Planned hierarchy of road network from Village Road to National Highways and other transport networks.
- Stronger intra and inter regional trades engender higher income.
- With deeper trade, investment and connectivity to benefit from new markets, new import/export sources of high quality and better priced products, increasing opportunities for transport & logistics services.
- As per the World Bank 2016, Rural Access Index (RAI) of Bangladesh is 86.7% that is very much favourable to reap benefits for the people of the remotest corners.
- GDP Growth Rate and Per Capita Income achieved 6.5% and USD 865 in 2012 and expected GDP Growth Rate and Per Capita Income are 8% and USD 1909 respectively in 2019 (World Bank).
- This economic momentum w’d help become a middle-income country by 2021 and a developed country by 2041.
# Linking national and local road networks to reap the benefits of connectivity

## Table - Summary of the RAI

<table>
<thead>
<tr>
<th>Country</th>
<th>Population (million)</th>
<th>Land area (1,000 km²)</th>
<th>Population density</th>
<th>Road data length (km)</th>
<th>Original RAI, 2006</th>
<th>New RAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>159.1</td>
<td>130.2</td>
<td>1222</td>
<td>250688</td>
<td>37</td>
<td>86.7</td>
</tr>
<tr>
<td>Nepal</td>
<td>28.2</td>
<td>143.4</td>
<td>197</td>
<td>77819</td>
<td>17</td>
<td>54.2</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>97.0</td>
<td>1000.0</td>
<td>97</td>
<td>85880</td>
<td>32</td>
<td>21.6</td>
</tr>
<tr>
<td>Kenya</td>
<td>44.9</td>
<td>569.1</td>
<td>79</td>
<td>160886</td>
<td>44</td>
<td>56.0</td>
</tr>
<tr>
<td>Mozambique</td>
<td>27.2</td>
<td>786.4</td>
<td>35</td>
<td>29614</td>
<td>27</td>
<td>20.4</td>
</tr>
<tr>
<td>Tanzania</td>
<td>51.8</td>
<td>885.8</td>
<td>59</td>
<td>94039</td>
<td>38</td>
<td>24.6</td>
</tr>
<tr>
<td>Uganda</td>
<td>37.8</td>
<td>199.8</td>
<td>189</td>
<td>140910</td>
<td>27</td>
<td>53.1</td>
</tr>
<tr>
<td>Zambia</td>
<td>15.7</td>
<td>743.4</td>
<td>21</td>
<td>51070</td>
<td>64</td>
<td>17.0</td>
</tr>
</tbody>
</table>

Strengthening government capacities in planning and implementing the rural transport connectivity

- Bangladesh Planning Commission is responsible for the formulation of the policy planning, sectoral planning, program planning and project planning.
- Planning Wing of the MoLGRD provides instructions for project proposals as per above planning.
- LGED as an implementing agency submit project proposals for approval going through prioritization planning process and implement those projects accordingly (Offline & Online).
- LGED uses eGP system by 100% in bidding, evaluating, awarding, approving and contracting processes along with online submission and approval of Annual Procurement Plan.
- Annual Performance Agreement (APA) of executives at different levels to measure responsibility and accountability.
- LGIs with technical support from LGED is also involved in planning and implementing rural transport connectivity small scale projects.
E-Governance in Practice

- Introduction of Digital ECNEC for processing and approving project proposals.

- LGED is the pioneer, among other Govt. organization, to make the e-GP system operational.

- LGED has started implementation of e-Filing to ensure alignment with digital government.
Data collection, monitoring and analysis for rural connectivity, including GIS and spatial data

- Geographic Information System (GIS) has been using in this organization since 1992.
- LGED has developed very strong GIS database consisting of 19 layers of information of different features and generated 492 Upazila Maps and 64 District Maps covering entire country.
- Geo-spatial database and various geospatial technology are used for planning and monitoring of a wide range of development activities of LGED.
- Depending on different administrative location, each road has unique ID. Segment wise surface type (Paved and earthen) information of each road is also available in geospatial database.
- Geo-location information of each road has various attribute information like surface type, surface condition, traffic information (Annual Average Daily Traffic-AADT, Commercial Vehicle Per Day-CVD), geometry of road, development/maintenance history etc. as well as stored in RSDMS Database separately.
GIS

- GIS started in early Nineties
- As planning and monitoring tools
- Geo-Spatial database covering 19 layers of information
- District & Upazila base map and make available to public through website
GIS

Development of GIS Digital Map

1992 GIS Unit

- Old Thana Maps
- Topo Maps
- Satellite Images
- Aerial Photographs

JICA supported

Updated Upazila Map (2008-2011)
- Standardization of GIS Database
- Updating District & Upazila Map using Satellite Imagery
- Released Upazila Map on LGED Website by Hon’ble Prime Minister

Thana Base Map developed in 1992-94 (UNDP/ ILO)

Geo-referencing & Digitization (1994-97)

Digital Geo-Spatial Database

GPS Survey (1998-99)

Field Checking by UPZ Staff & LGIs Person (1999-2005)

Upazila Digital Map (2008)
Use of data from non-transport sectors to better integrate SDGs in rural transport policies and projects

- According to Vientiane Declaration 2017 adopted in Environmentally Sustainable Transport (EST Forum) meeting held at Laos on rural access is crucial to achieve a number of SDG targets related to access to health, education, employment, markets.

- From several impact studies conducting by numerous national and international organizations on rural sectors, some non-transport sectors data has been calculated from development project works.
Data of Non-Transport Sector

- **Traffic volume increased** 309% for non-motorized and 156% for motorized
- **Vehicle Operation Cost reduced** 40%
- **EIRR** found 20% for Upazila Road, 36% for Growth Centres and 25% for Bridge/Culvert
- **Travel time reduced** 60% for motorized and 40% for non-motorized
Data of Non-Transport Sector

- **Production of jute, paddy** increased 180%
- **Health Care and Family Planning** facility increased 37%
- **Attendance in school** increased 24% for boys and 59% for girls
- **Shops / Industries** increased 24%
- **Annual Lease Money** increased 38%
- **Traders** increased 16% and **buyers** increased 25%
Use of data from non-transport sectors to better integrate SDGs in rural transport policies and projects (Cont.)

Table : Non Transport Sector Data Linkage with Sustainable Development Goal (SDG)

<table>
<thead>
<tr>
<th>Non-Transport Sector data</th>
<th>Non-Transport Sector Results</th>
<th>Linkage with Sustainable Development Goal (SDG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic volume</td>
<td>309% for non-motorized and 156% for motorized increased</td>
<td>(Linkage with SDG Goal 9 – SDG Indicator 9.1.1, SDG Goal 11 – SDG Target 11.2)</td>
</tr>
<tr>
<td>Vehicle Operation Cost</td>
<td>40% reduced</td>
<td>(Linkage with SDG Goal 9 – SDG Indicator 9.1.1, SDG Goal 11 – SDG Target 11.2)</td>
</tr>
<tr>
<td>EIRR Found</td>
<td>20% for Upazila Road, 36% for Growth Centres and 25% for Bridge/Culvert</td>
<td>(Linkage with SDG Goal 9 – SDG Indicator 9.1.1, SDG Goal 11 – SDG Target 11.2)</td>
</tr>
<tr>
<td>Travel time</td>
<td>60% for motorized and 40% for non-motorized reduced</td>
<td>(Linkage with SDG Goal 9 – SDG Indicator 9.1.1, SDG Goal 11 – SDG Target 11.2)</td>
</tr>
<tr>
<td>Production of jute, paddy</td>
<td>180% (increased)</td>
<td>(Linkage with SDG Goal 1 SDG Goal 1 - SDG Target 1.1, 1.3, &amp; 1.4, SDG Goal 2 - SDG Target 2.3, 2.4 &amp; 2.a)</td>
</tr>
<tr>
<td>Health Care and Family Planning facility</td>
<td>37% (increased)</td>
<td>(Linkage with SDG Goal 3 - SDG Target – 3.6, SDG Goal 5 - SDG Target – 5.5)</td>
</tr>
<tr>
<td>Attendance in school</td>
<td>24% for boys and 59% for girls (increased)</td>
<td>(Linkage with SDG Goal 4 - SDG Target – 4.a, SDG Goal 5 - SDG Target – 5.5)</td>
</tr>
<tr>
<td>Shops / Industries</td>
<td>24% (increased)</td>
<td>(Linkage with SDG Goal 2 - SDG Target 2.3, 2.4 &amp; 2.a)</td>
</tr>
<tr>
<td>Annual Lease Money</td>
<td>38% (increased)</td>
<td>(Linkage with SDG Goal 1 - SDG Target 1.1, 1.3, &amp; 1.4)</td>
</tr>
<tr>
<td>Traders and buyers</td>
<td>16% and 25% increased respectively</td>
<td>(Linkage with SDG Goal 1 - SDG Target 1.1, 1.3, &amp; 1.4)</td>
</tr>
</tbody>
</table>
Future priorities

- Making Ownership & Database of Waterways
- Identification & integration of Core Rural Road and Water Transport Network
- Automation of Prioritization Planning for development and maintenance of Rural Roads
- Introduction of Effective Asset Management System
- Mainstreaming of Cross-cutting Issues (Climate Resilience, Gender Equity, Road Safety, Environmental & Social Effects, Occupational Health & Safety)
- Updating Organizational Monitoring System, Quality Assurance Plan and Grievance Redress Mechanism
- Measuring rural access accurately and effectively: The aim with the updated methodology and increased coverage is to raise the RAI from Tier III to Tier I or II indicator
Conclusions

• ‘Rural transport connectivity to regional and international transport networks’ is a **demand of time**.
• High Road Density & RAI, systematic management and access to almost all rural markets & social institutions indicate that Bangladesh is **prepared** for ‘Rural transport connectivity to regional and international transport network’.
• It would be a **paradigm shift** not only in economic development but also socio-cultural development at local level.
• It would be a **pathway** of exchanging local knowledge and appropriate technologies in development of transport development and farm & non-firm produces as well.
• Many places isolated and remote because of international borders and other natural barriers, having much potentials would be **centres of economic activities**.
Recommendations

- Identification of core rural transport network to be upgraded with international design standards and specifications addressing all cross-cutting issues.
- Preparation of comprehensive Local Area Master Plan based on potentials of local resources.
- Implementation of relevant agreements made among regional/international countries starting with flexibility of visa systems.
- Introduction of hassle-free movement of commercial and other vehicles throughout the region to avoid multiple loading/unloading.
Rural Road Development
Rural Road Development

Submergible Road in Haor Area

Upazila Road at Savar, Dhaka
Concrete Paving Block
Special Rural Road Development

Rampal Coalbased Power Plant Connecting Road, Bagerhat under Ministry of Power, Energy & Mineral Resources
Large Bridges on Rural Roads

850 M long ‘Sheikh Hasina Tessta Bridge’ in Lalmonirhat
Large Bridges on Rural Roads

950 M long ‘Sheikh Hasina Dharala Bridge’ in Kurigram
Large Bridges on Rural Roads

771 M long ‘Sheikh Hasina Titas Bridge’ in Brahmanbaria District
River Jetty for Rural Waterway
Jetty on Naf River
Development of Growth Centre/Rural Market

Gourishankar Hat, Raujan Upazila, Chattogram
New Model of Growth Centers and Rural Markets

NangalKoat Upazila

Hathazari Upazila
Border Haat with India
Thank You