

Transport Sector Brief Bangladesh

Introduction

The rising threat of climate-related hazards is already being witnessed with increasing severity and frequency of disasters occurring in South Asia.

According to the World Bank, between 1990 and 2019, climate-induced disasters in South Asia affected 1.68 billion people, killed approximately 267,000 and caused over US\$127 billion in economic losses.

The region's endeavor to achieve sustainable growth and reduce poverty is often hampered due to the impacts of climate change on people's livelihoods, food security and health. A World Bank study has warned that, without climate change adaptation, 800 million (or 44 percent) people in South Asia will be living in moderate or severe climate hotspots by 2050 which will push millions of people below the poverty line.

The negative effects of extreme weather and climate events also undermine productivity in key economic sectors such as agriculture, transport, energy, and manufacturing, with limited adaptive capacity in these countries causing further constraints on their development prospects.

Overview of climate change in Bangladesh

Bangladesh is one of the most vulnerable countries to climate change due to a combination of geographical and socio-economic factors, including its low-lying delta and coastal areas, high population density,

poverty level, and lack of resilient infrastructure. Rural and coastal communities have been exposed to climate-induced extreme events, such as erratic rainfall, flooding, drought, sea-level rise, cyclones and salinity intrusion. Consequently, disasters have exacerbated migration to cities, resulting in unplanned and rapid urbanization in the country.

In response, the Government of Bangladesh has placed high priority on building the country's capacity to mitigate and adapt to climate change. The Ministry of Environment, Forest, and Climate Change, Bangladesh has identified six thematic areas, including agriculture and food security; human wellbeing; water resources; disaster risk management; and infrastructure, to invest in and mobilize climate services through corresponding programs to function within a 'multi-institutional architecture'.

Yet, institutional challenges to climate change adaptation prevail particularly in developing an integrated approach to transform climate change vulnerabilities into adaptation opportunities and mainstream them into development programs at sub-national levels.

Climate change impact on transport sector

Increasing climate risks impact the entire transport value chain from its location to design, construction standards and services it provides. These risks raise the question of whether new or existing transport infrastructure should be adapted to new climatic conditions.

Although the urgency of adaptation in the transport sector has become a priority for Parties to the United Nations Framework Convention on Climate Change (UNFCCC),

only 13 percent of the submitted Intended nationally determined contributions (NDCs) prioritize transport-related adaptation measures and 4 percent identified transport-specific adaptation strategies (Paris Process on Mobility and Climate, 2015). Additionally, gaps persist in the areas of impact assessment, implications for design guidelines, and appropriate national policies and strategies for the transport sector (IPCC, 2014).

Road infrastructure that is the major national passenger traffic mode, especially in the flat terrain of Bangladesh, is generally in poor condition with a high proportion of unpaved roads. Most of the rural roads are under the jurisdiction of the Local Government Engineering Department (LGED) with limited resources and technology to adapt.

The existing road design standards in the country are in need of climate resilience considerations, especially in areas with major risks of flooding and storm surges that may cause erosion and damage to the road.

Therefore, ensuring climate resilience in the transport sector in Bangladesh is imperative for allowing other sectors to quickly rebound after disasters and climate-related shocks.

CARE for South Asia Project

Asian Disaster Preparedness Center (ADPC) and the Regional Integrated Multi-Hazard Early Warning System (RIMES) are jointly implementing a five-year (2020-2025) regional project called *Climate Adaptation and Resilience (CARE) for South Asia* with support from the World Bank.

The project's overall objective is to contribute to an enabling environment for climate resilience policies and investments in agriculture, transport, water, and policy, planning and finance sectors in South Asia. With a regional outreach, the national-level activities will initially be implemented in Bangladesh, Nepal and Pakistan.

ADPC is implementing the second component of the project which focuses on enhancing policies, standards,

and capacities for climate-resilient development in South Asia. It also seeks to promote the transformation of policies, standards and institutional capacities for climate-resilient development across the key sectors.

ADPC will facilitate high-level dialogues, develop climate-resilient guidelines, and promote innovation and adoption of disruptive technology at national and regional levels.

Support to implement climate resilience priorities

ADPC will work with the Local Government Engineering Department (LGED) under the Ministry of Local Government, Rural Development and Co-operatives, and other relevant agencies including Roads and Highways Department (RHD) under the Ministry of Road Transport and Bridges (MoRTB), to revise and operationalize climate resilience strategy that is informed by the results of hazard, vulnerability, and risk assessment for road infrastructure.

Stakeholders have expressed the need to improve existing designs and construction standards of rural and strategic roads in the country. However, a major challenge for the road sector in Bangladesh lies in developing stakeholders' capacity to absorb and utilize the scientific information on climate change to improve construction standards. The project will provide technical support to upgrade these standards and build the capacity of relevant government agencies for implementing climate risk management solutions

The National Land Transport Policy (NLTP) of Bangladesh envisages the long-term development of a safe, cost-effective, modern, and environmentally sustainable national land transport system. A Planning Guidelines for Rural Road Master Plan (LGED, 2010) was also prepared to achieve the goals set by the NLTP. Major requirements by the NLTP for the existing policies include improving integrated planning for national land transport,



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adequate attention to road maintenance, and improvements to existing design standards for safety enhancement.

Although the current policies are primarily focused on hazard impacts, particularly for flooding, climate risk considerations should be incorporated in the policy standards and guidelines for rural road design, construction, and maintenance.

Support to implement transport sector priorities

ADPC is working with the relevant stakeholders in Bangladesh to implement the following key actions:

- i. Develop and strengthen evidence-based resilient policies, strategies and actions; investment plans that are informed by hazard, vulnerability: and risk assessments, and integrate and operationalize key plans and policies into climate resilient road networks development in Bangladesh. A pilot climate-inclusive risk assessment will be conducted in selected districts that will support the revision of existing strategies and policies for rural roads.
- ii. Revision of the Construction Practices and Procedures Manual to incorporate climate-resilient design and practices, including strategic and rural roads in Bangladesh based on the regional guidelines. The results from the climate-inclusive risk assessment; will provide a background needed to update the current construction guidelines for future climate extreme events.
- iii. Build capacity of government officials on climate resilience-adaptive policy making, design and solutions in the transport sector in Bangladesh. The focus will be on the utilization of geo-hazard assessments, hazard maps and climate data for undertaking climate-resilient design and construction. Training and capacity needs assessment will be carried out to identify potential participants and subject areas within the identified departments and ministries.
- iv. In addition to the primary focal agency, the Ministry of Road Transport and Bridges (MoRTB) will also be engaged. ADPC will establish a mechanism to support national level centers of excellence and universities for technical

collaboration with key government agencies. These activities will be synchronized with the existing functions of the Climate Resilient Local Infrastructure Centre (CRoLIC) at the Local Government Engineering Department (LGED).

- v. Due to the prevailing susceptibility of socio-economic conditions to development in the country, a special emphasis will be placed to include gender and other cross-cutting issues from the planning stage. The project will support in generating gender-disaggregated data analytics on gender differences in vulnerabilities and hotspots. This will help make the decision and policy making process of climate change adaptation more gender-responsive.

Expected outcomes

Some of the outputs will include vulnerability maps of rural roads in selected districts under climate risks; feasibility reports for potential adaptation options and priorities; and strategies and action plans for the low carbon rural road infrastructures.

Furthermore, the existing road construction guidelines for rural and strategic roads in Bangladesh will be upgraded to incorporate climate adaptation aspects with specific recommendations to the existing construction practices and procedures. Finally, the stakeholders will be trained to build their capacity on policy, guidelines and investments.

The expected outcomes include:

- Mainstreaming of climate resilience and adaptation into national policies, plans and investments for road infrastructure development;
- Revising Construction Practices and Procedures Manual incorporating climate-resilient design and practices for strategic and rural roads;
- Incorporation of regional climate resilience guidelines into national standards;
- Strengthening institutional capacities for the transport sector to undertake climate-informed policies and planning in road infrastructure development (design & construction).

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Transport Sector Brief Nepal

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The region's endeavor to achieve sustainable growth and reduce poverty is often hampered due to the impacts of climate change on people's livelihoods, food security and health. A World Bank study has warned that, without climate change adaptation, 800 million (or 44 percent) people in South Asia will be living in moderate or severe climate hotspots by 2050 which will push millions of people below the poverty line.

The negative effects of extreme weather and climate events also undermine productivity in key economic sectors such as agriculture, transport, energy, and manufacturing, with limited adaptive capacity in these countries causing further constraints on their development prospects.

Overview of climate change in Nepal

Nepal is highly vulnerable to climate change mainly because of its challenging topography and diversity of climate zones, fragile socio-economic conditions and sensitive ecosystems. In addition, poverty and social disparity as well

as people's natural resources-based livelihoods have made Nepal more vulnerable towards the impacts of climate change.

Being fully aware of the challenging tasks to build a climate resilient society, the Government of Nepal has undertaken several policies and actions to address climate change and has also been actively participating in global efforts to respond to climate change.

Yet, institutional challenges to climate change adaptation prevail particularly in developing an integrated approach to transform climate change vulnerabilities into adaptation opportunities and mainstream them into development programs at sub-national levels.

Climate change impact on transport sector

Increasing climate risks impact the entire transport value chain from its location to design, construction standards and services it provides. These risks raise the question of whether new or existing transport infrastructure should be adapted to new climatic conditions.

Being a landlocked country with fragile geology and topography comprised of hills and mountains, Nepal is facing considerable challenges in road development. Particularly the increasing climate change impacts triggered by the melting Himalayan glaciers and heavy monsoon rainfall result in accelerated surface run-off from slopes and increased flows in rivers, streams and drainage channels.

These phenomena bring adverse impact on the stability and performance of road infrastructure and networks. Climate resilience aspects of road transport should, therefore,

be incorporated into the existing construction and design standards of the country, especially in areas that face high risks of flooding and landslides that may cause erosion and damage to the transport infrastructure.

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Support to implement climate resilience priorities

Funded by the central government and international development agencies, road development activities in Nepal have accelerated in recent decades. This was driven by the country's new constitution in 2015 which emphasized decentralization of

economic growth and infrastructure provision to the remote and isolated rural and mountainous settlements.

The Local Road Network Statistics 2016 estimated the total length of rural roads was 57,632 km. Similarly, the Statistics of Strategic Roads Networks (SSRN) 2017-18 suggested the total length of SSRN as 13,448 km (DoR,

2017/18). Among the total of around 71,080 km of the road network, only 12.6 percent are paved with blacktop and asphalt surface and the remaining are either gravel or earthen surface which are more vulnerable to climate-related hazards.

In addition to the need to update its road inventory, Nepal lacks detailed standards for climate-resilient rural road design and construction. Therefore, together with the Department of Roads (DoR) and other relevant agencies, the project aims to upgrade Nepal Roads Standards 2070 and Nepal Rural Roads Standards 2071 to enable climate risk informed plan, design and investment.

Other documents such as National Transport Policy 2058, Nepal Bridge Standard 2067, and the DoR Strategy 1995 to support the DoR Priority Investment Plan 2014/15 to 2021/22, will also be reviewed and climate change related parameters will be added wherever required. Furthermore, current provisions and practices of slope protection using bioengineering and other nature-based solutions will be reviewed for their effective use in road construction and maintenance.

ADPC will work with the DoR under the Ministry of Physical Infrastructure and Transport (MoPIT) and other relevant agencies to develop evidence-based resilient policies, strategies and action/investment plans. To ensure the sustainability of the project, ADPC will build the capacity of government officials on climate resilience-adaptive policy-making, design and solutions in the transport sector.



Support to implement transport sector priorities

ADPC is working with the relevant stakeholders in Nepal to implement the following key actions:

- i. Develop and strengthen evidence-based resilient policies, strategies and actions; investment plans that are informed by hazard, vulnerability, and risk assessments; and integrate and operationalize key plans and policies into climate resilient road networks development in Nepal.
- ii. Upgrade Nepal Roads Standards 2070 and Nepal Rural Roads Standards 2071 to meet climate resilient standards.
- iii. Build the capacity of government officials on climate resilience-adaptive policy making, design and solutions.

In addition to focal agencies, the Department of Local Infrastructure (DoLI) under the Ministry of Federal Affairs and General

Administration (MoFAGA) will also be engaged as key stakeholders. DoLI, with support from the Research of Community Access Partnership (ReCAP), has conducted research on livelihood enhancement strategy for roadside plantations through the utilization of the Right of Way (RoW) process that strengthens the livelihood of disadvantaged people who live in close proximity to roads. The concept will be referenced while making roadside slope protection plans in rural roads, wherever appropriate.

Furthermore, the Ministry of Physical Infrastructure and Transport (MoPIT) is planning to establish a training center for both private and public engineers to build their capacity on multi-hazard resilient roads construction and maintenance. In this context, CARE for South Asia project will support the development of curriculum, modules, and training materials on incorporating resilience into transport planning and assessment.

Due to the prevailing susceptibility of socio-economic conditions to development in the country, a special emphasis will be placed to

include gender and other cross-cutting issues from the planning stage. The project will support in generating gender-disaggregated data analytics on gender differences in vulnerabilities and hotspots. This will help make the decision and policy making process of climate change adaptation gender-responsive.

Expected outcomes

The policy documents in the transport sector will be updated to incorporate climate resilience considerations for the planning and investment of road and bridge development. Practices of slope protection will be reviewed and enhanced by comparing bioengineering and nature-based solutions. The expected outcomes include the following:

- Enhanced road sector policy, strategy, and standards that integrate climate resilience considerations;
- Provision of hazard, risk, and exposure-based scale-up plan for implementation of appropriate slope stabilization solutions to mitigate climate and disaster risks;
- Incorporation of regional climate-resilient design guidelines into national standards;
- Enhanced capacities of government officials from the key focal agencies. The focus will be on the utilization of geo-hazard assessments, hazard maps and climate data for undertaking policies and planning of climate-resilient road infrastructure design and construction.

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