

CLIMATE CHANGE ASSESSMENT

I. Basic Project Information

Project Title: Central Asia Regional Economic Cooperation Corridors 2, 5, and 6 (Dushanbe–Kurgonteppa) Road Project – Additional Financing
Project Budget: \$107.5 million
Location: Tajikistan
Sector: Transport
Theme: Inclusive economic growth, environmentally sustainable growth, and regional integration
<p>Brief Description</p> <p>The government has requested the Asian Development Bank’s (ADB) assistance to progressively upgrade the 82 km Dushanbe–Kurgonteppa road, for which ADB has programmed two projects in 2016 (current project) and 2018 (proposed additional financing).^a Additional financing is sought to scale up the project by improving a contiguous 40-km road section (Chashmasoron–Kurgonteppa) to the current 33-km project road (Dushanbe–Chashmasoron). The road is a strategic north–south link, and one of the most heavily travelled roads in the country, as well as the confluence of CAREC corridors 2, 5, and 6. The project road passes through terrain that varies from flat to mountainous, and a further 90 km beyond Kurgonteppa connects Dushanbe to Afghanistan. The government has also requested ADB assistance through the proposed additional financing to improve several short sections of the national highway network that have substantial road safety-related deficiencies.</p> <p>The completed road will have two carriageways each with two traffic lanes 3.5m wide, separated by a median typically 2 m wide in rural areas and narrower where the road passes through villages and difficult mountain terrain. The project road alignment will follow the existing road alignment, because of terrain considerations and also to minimize land acquisition, with some adjustments to horizontal and vertical alignments to meet the required standards. The design speed will typically be 100 km per hour, which is appropriate for a road of this class in the terrain through which it passes. The scope of construction work includes earthwork, flexible pavement with asphaltic concrete surfacing, bridges, drainage structures, roadside improvements, and safety engineering features such as road signs and markings, traffic barriers, pedestrian crossings, and road lighting.</p>

II. Summary of Climate Risk Screening and Assessment

A. Sensitivity of project component(s) to climate/weather conditions and sea level	
<p>Project components:</p> <ol style="list-style-type: none"> 1. Improved road conditions, facilities, and safety along, and in the vicinity of, the project road; 2. Strengthened institutional capacities of the Ministry of Transport; 3. Completed procurement readiness for the next section of the road to be improved; 4. Improved safety on selected priority sections of the national highway network. 	<p>Sensitivity to climate/weather conditions and sea level:</p> <ul style="list-style-type: none"> ▪ Winter and summer temperature contrast, annual mean temperature; ▪ Flooding; ▪ Precipitation-induced landslides and mudslides.
B. Climate Risk Screening	
<p>Risk topic:</p> <ol style="list-style-type: none"> 1. Temperature increase 	<p>Description of the risk:</p> <ol style="list-style-type: none"> 1. Increase of mean and extreme temperature may lead to faster pavement rutting due to increase of plasticity of bitumen in the wearing course.

2. Flood increase	2. Floods, landslides, and mudflows due to more intense rainfall may affect bridges and roads access, performance, and longevity.
Climate Risk Classification: <i>Medium</i>	
<p>C. Climate risk assessment</p> <p>A climate risk assessment and management was undertaken during the preparation of the original project. The main climate change hazards identified include:</p> <ul style="list-style-type: none"> (i) Increase of mean and extreme temperature, especially in low lying sections of the project road (low to medium risk); (ii) Floods and water logging in the Vakhsh River's floodplain, which has a hydrological regime that is particularly influenced by snow and glacier melting (medium risk); (iii) Gully erosion and landslides in the mountainous section of the project road where quaternary loess sediments prevail (medium risk); and (iv) Mudflows in the mountainous section of the project road (low risk). 	

III. Climate Risk Management Response within the Project

The climate risk assessment and management has identified and recommended the following climate change adaptation measures, which have been incorporated into the project engineering design:

- Extended drainage systems with increased size and number of drainage structures to reduce the risk of road over-flooding and water ponding along the roads;
- Provision of interceptor ditches on the top of vulnerable cut slopes including lining with geotextile filter to reduce risk of landslides and development of erosion gullies.

Incremental adaptation costs were derived from the bill of quantities of the civil works contract. It is estimated that incorporating the recommended climate change adaptation measures increased the total civil works cost above the no-climate baseline design by approximately \$900,000. These adaptation measures have been duly reflected in the engineering design approved by the government.

Adaptation measures	Cost estimate (\$)
Extended drainage systems	830,000
Protection of vulnerable slopes	60,000
Realignment of a creek (Km 35-Km36)	10,000
Total	900,000

Source: project preparatory technical assistance consultants.

On the mitigation side, the current project will help scale up the solar-powered LED road lighting and solar -based power back-up systems introduced in the original project.^a These clean energy technologies will contribute to improved living standards in the towns and villages along the project road, and to reduced CO₂ emissions.

^a ADB. 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Loan, Grant, and Administration of Grant to the Republic of Tajikistan for the CAREC Corridors 2, 5, and 6 (Dushanbe–Kurgonteppa) Road Project*. Manila.

^b Financed by \$2.0 million grant from the Multi-Donor Clean Energy Fund under the Clean Energy Financing Partnership Facility.