

PROJECT CLIMATE RISK ASSESSMENT AND MANAGEMENT REPORT

I. Basic Project Information

Project Title: Central Asia Regional Economic Cooperation Corridors 2, 5, and 6 (Dushanbe–Kurgonteppa) Road Project
Project Budget: \$96.4 million
Location: Tajikistan
Sector: Transport
Theme: Inclusive economic growth, environmentally sustainable growth, and regional integration
<p>Brief Description:</p> <p>The proposed Central Asia Regional Economic Corridors 2, 5, and 6 (Dushanbe–Kurgonteppa) Road Project (the project) will enhance regional integration and inclusive economic growth in Tajikistan by improving efficiency and safer movement of goods and people on an approximately 33 kilometer (km) section from Dushanbe to Chashmasoron of the Dushanbe to Kurgonteppa road. Dushanbe is the capital and largest city of Tajikistan, and is home to 775,000 people. Kurgonteppa is the capital of the Khatlon region and the third largest city in Tajikistan, with a population of about 100,000. The project road passes through terrain that varies from flat to mountainous, and connects Dushanbe to Afghanistan. Except for a 3.4 km section immediately south of Dushanbe, the road is two-lane with little in-built safety features.</p> <p>The completed road will have two carriageways each with two traffic lanes 3.5m wide, separated by a median typically 3m 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 component</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. 	<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 2. Flood 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. Floods, landslides, and mudflows due to more intense rainfall may affect bridges and roads access, performance, and longevity.

Climate Risk Classification: **Medium**

(i) Climate risk assessment

A climate risk assessment and management was undertaken during project preparation. The main climate change hazards identified include:

- (ii) Increase of mean and extreme temperature, especially in low lying sections of the project road (low to medium risk);
- (iii) Floods and water logging in the Kofarnigon River's floodplain, which has a hydrological regime that is particularly influenced by snow and glacier melting (medium risk);
- (iv) Gully erosion and landslides in the mountainous section of the project road where quaternary loess sediments prevail (medium risk); and
- (v) 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 system with larger culvert sizes to reduce the risk of road over-flooding and water ponding along the roads;
- Interceptor ditches on vulnerable cut slopes including lining with geotextile filter and stone riprap protection to reduce risk of landslides and development of erosion gullies.

Incremental adaptation costs were computed at 5% for culverts and drainage works and at 0.5% for earthworks. 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 \$500,000.

Adaptation measures	Cost estimate (\$)
Extended drainage system	460,000
Protection of vulnerable slopes	40,000
Total	500,000

Source: project preparatory technical assistance consultants

On the mitigation side, the project will introduce clean energy technologies, such as solar street lighting and solar based power back-up systems, to enhance the reliability and efficiency of power solutions along, and in the vicinity of, the project road. This will contribute to improved living standards in the villages along the project road, and to reduced CO₂ emissions (estimated at 28 tons per annum). This will be financed by a \$2.0 million grant from the Multi-Donor Clean Energy Fund under the Clean Energy Financing Partnership Facility.