Project Climate Risk Assessment and Management Report

I. Basic Project Information

Project Title: SASEC Second Bangladesh–India Electrical Grid Interconnection Project
Project Budget: $183.2 million
Location: Bheramara, Ishurdi, Bangladesh
Sector: Energy
Theme: Electricity transmission
Brief Description SASEC Second Bangladesh–India Electrical Grid Interconnection Project amounting to $183.2 million is aimed to upgrade the power transmission capacity of the existing grid interconnection between Bangladesh and India from 500 megawatt (MW) to 1000 MW. This will allow Bangladesh to increase the import of electricity from India to meet increasing power demand.

II. Summary of Climate Risk Screening and Assessment

A. Sensitivity of project component(s) to climate/weather conditions and sea level

Project component	*Sensitivity to climate/weather conditions and sea level*
1. Enhancement of the Baharampur – Bheramara power transmission link through the installation of a second asynchronous 400 kV/230 kV, 500MW HVDC back to back substation in Bheramara. 2. Construction of 12 km of 230 kV transmission line from the HVDC substation to the Bangladesh grid and associated facilities. 3. Improvement of the capacity in Power Grid Company of Bangladesh on technical, project management, regulatory and financial aspects by 2017.	*1.* Increased precipitation is likely to lead to river flooding from Padma River and flash flooding from heavy monsoon downpours. Flooding can affect the location and integrity of the sub-station, and the integrity of transmission towers. *2.* Strong wind from cyclones and tornadoes can cause tower and conductor damage. *3.* Increase in temperature can reduce the efficiency of transmission lines by increasing resistance.

B. Climate Risk Screening

Risk topic	Description of the risk
1. Temperature increase 2. Rainfall increase	1. Annual mean temperature within the project area is projected to increase by 2.4° Celsius against the baseline period (1960-1990). The highest temperature rise is projected to occur in the month of April (>3°C), and the lowest rise is projected for the month of June (<2°C). 2. Annual precipitation is projected to increase by 77 mm or 5.3%. The increase is projected to occur mainly during the monsoon season from May to October.

Climate Risk Classification *[Low, Medium and High] Medium*

C. Climate risk assessment

1). The main climate impact on the current project is increasing risks of hydro-meteorological hazards. The project area is prone to flooding, lightning, hailstorms, cyclones, and tornadoes. Flooding affects many aspects of the power system, but is a major concern to the substation. The risks of both river flooding and flash flooding are projected to increase in the future. Transmission lines are particularly vulnerable to strong winds of cyclones and tornadoes. Projections indicate that both of these natural hazards may become more violent in the future. Lightning surges may cause serious damages to the expensive equipment in the power system either by direct strokes on the equipment or by strokes on the transmission lines that reach the equipment as traveling waves.

2). Rise in the ambient temperature can impact electricity transmission and distribution. Higher temperatures cause thermal expansion of power lines, which results in line sag, de-rating of transformers, increased resistance of transmission and decreased amount of power that can be securely transported, and increased demand puts extra electricity flowing through the lines thereby generating extra heat.

III. Climate Risk Management Response within the Project

1. Project will help better cope with climate variability and change through specifically identifying and locating substation and transmission towers in suitable locations.
2. In addition to mitigate the potential climate change impact, it is recommended to take into account flood risk during the construction of the substation as well as risk of heavy winds. The land identified for the Bheramara sub-station area has been elevated in 2010 to stand flood of more than 100-year return period. Transmission line will be constructed to withstand strong winds from cyclones and tornadoes.
3. Specifications of transmission line are expected to withstand the projected increase in ambient temperature and have limited impacts to sagging and overall efficiency.