GOVERNMENT OF INDIA
MINISTRY OF ROAD TRANSPORT AND HIGHWAYS
RAJYA SABHA
UNSTARRED QUESTION NO - 427
ANSWERED ON - 22/07/2026

CLIMATE - RESILIENT ROAD INFRASTRUCTURE

427. SMT. SUDHA MURTY:

Will the Minister of ROAD TRANSPORT AND HIGHWAYS be pleased to state:

(a) whether Government has taken steps to promote the use of climate-resilient materials and construction techniques in the development and maintenance of National Highways and other road infrastructure;

(b) whether any guidelines or standards have been issued for designing roads that can better withstand extreme weather events such as floods, heat waves and heavy rainfall;

(c) whether pilot projects or best practices involving innovative materials or climate-resilient road engineering are being implemented across States; and

(d) whether Government has examined international best practices in climate-resilient road construction adopted by countries such as Japan and Netherlands?

ANSWER

THE MINISTER OF ROAD TRANSPORT AND HIGHWAYS

(SHRI NITIN JAIRAM GADKARI)

(a) to (b) National Highways (NHs) Projects including those sections of NHs experiencing extreme weather events such as floods, heat waves and heavy rainfall are planned, designed, constructed and maintained in accordance with the provisions of Indian Roads Congress (IRC) codes and specifications. IRC has published several guidelines/standards/techniques such as 'IRC:52 Guidelines for the Alignment Survey and Geometric Design of Hill Roads', 'IRC:75(Part-2) Guidelines for Retrofitting Measures for Protection of Road Systems Including Surrounding Areas from Rainfall, Waterlogging and Flooding', 'IRC:138 Guidelines for Highway Engineers on Disaster Resilient Green Highways in Multi-Hazard Ecosystem', 'IRC: SP:48 Hill Road Manual', 'IRC:SP:106 Engineering Guidelines on Landslide Mitigation Measures', ' IRC:SP:113 Guidelines on Flood Disaster Mitigation for Highway Engineers' etc. These guidelines or standards incorporate climate-resilient materials and construction techniques for designing roads that can withstand extreme weather events such as floods, heat waves and heavy rainfall. Also, policy circulars have been issued such as selection of bitumen with due consideration of prevailing temperature, Cutting of hill slopes and completion of protection works for stabilization of slopes in initial period of contracts and taking up of road works subsequently only upon completion of these works, additional construction time to compensate for terrain-difficulty related formation cutting & slope stabilization, mandatory European Technical Assessment (ETA) certificate as well as CE

marking for rockfall mitigation in conformity with European Assessment Document (EAD), etc.

(c) to (d) IRC guidelines are developed on the basis of global successful best practices for climate-resilient road construction adjusted to local climatic & load conditions and outcome of indigenous research/pilot projects. These guidelines have the provisions of selection of alignment/improvement option on the basis of landslide susceptibility map, design criteria such as highest flood level, rainfall intensity, seismic zone, exposure condition like corrosion resistant reinforcement, road building materials of bitumen duly considering prevailing maximum & minimum pavement temperature/frost resistant materials, landslide protection measures including avalanche protection, etc. NHs planned, designed, constructed and maintained duly considering project specific climatic factors/design parameters/materials which results into climate resilient road infrastructure.

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