

GOVERNMENT OF INDIA  
MINISTRY OF RURAL DEVELOPMENT  
DEPARTMENT OF RURAL DEVELOPMENT

**LOK SABHA**  
**UNSTARRED QUESTION NO. 2254**  
ANSWERED ON 14/03/2023

**GRADIENT ISSUES ON ROADS IN HILLY AREAS**

2254. SHRI RAJMOHAN UNNITHAN:

Will the Minister of RURAL DEVELOPMENT be pleased to state:

- (a) whether as per the Pradhan Mantri Gram Sadak Yojana (PMGSY) current norms, the gradient allowed for the works is currently 1 unit of vertical length in 10 units of horizontal length which disqualifies these hill roads to be covered under PMGSY and if so, the details thereof;
- (b) whether the Government noticed about this gradient issues on roads in hilly areas which are built and monitored under PMGSY;
- (c) whether it will be considered to relax the PMGSY norms so that any roads in the hilly regions can be included in the project in the future; and
- (d) if so, the details thereof and if not, the reasons therefor?

**ANSWER**

MINISTER OF STATE IN THE MINISTRY OF RURAL DEVELOPMENT  
(SADHVI NIRANJAN JYOTI)

- (a) The gradient applicable for hill roads constructed under Pradhan Mantri Gram Sadak Yojana (PMGSY) (**IRC:SP:20 (Rural Roads Manual) / Hill Road Manual IRC:SP:48**) are given below:

Types of Longitudinal Gradient (except hairpin bends)	Mountainous Terrain	Steep Terrain
<b>Ruling Gradient</b>	5%	6%
<b>Limiting Gradient</b>	7%	8%
<b>Exceptional Gradient*</b>	10%	10%

*\* Length of exceptional gradient not to exceed 100 metre at a stretch. Successive stretches to be separated by a minimum length of 100 metre with gradient ruling or flatter.*

<b>Gradient (Hairpin Bends)</b>	
<b>Maximum</b>	2.5% (1 in 40)
<b>Minimum</b>	0.5% (1 in 200)

For existing roads, the existing vertical curves up to limiting gradient may be considered acceptable. Gradients steeper than limiting gradient but upto exceptional gradient in short stretches could also be considered acceptable unless there is evidence of site-specific problem. The existing hair pin bends may be considered acceptable unless there is site-specific problem and evidence of complaints from users, history of crashes.

(b) to (d): During 2010, geometric design standards were reviewed by the Expert Committee constituted by Ministry and it was decided that the gradient 1 in 10 is already relaxed (previously 1 in 12.5 as per IRC SP:20:2002) and no further relaxation should be allowed. If the gradient is steeper than the above prescribed norms then it will adversely impact road safety.

The Detailed Project Reports (DPRs) for works under PMGSY are required to conform to the above requirements. In addition, the National Quality Monitors and the State Quality Monitors check above requirements during their site visits.

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