



**KAMARAJ IAS ACADEMY**  
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# Green Roads

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**Why is in news?** 'Green roads' are key for sustainability in the Himalayas

**Green growth** is economic progress that fosters environmentally sustainable and socially inclusive development.

The focus of green growth is to ensure that natural assets deliver their full economic potential, which includes the provisioning of clean air and water, and a resilient biodiversity needed to support food security and promote human well-being.

## About IHR:

In this context, the **Indian Himalayan Region (IHR)** that spans **13 Indian states and union territories**, namely Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Uttarakhand, West Bengal, Ladakh, and Jammu and Kashmir, is of **great ecological significance** considering the Nature's Contribution to People (NCPs)/ecosystem services it provisions for the nation.

The Himalayas are characterised by **steep terrain, weak geology and heavy monsoon rains** and are vulnerable to erosion, earthquakes and landslides.

Policymakers of IHR are pragmatically envisioning green policies for biodiversity conservation, organic farming, green energy, water conservation, climate change adaptation etc.

This **push for green growth is not just** about lush forests, blue skies, clean air and pure streams, but **also about mainstreaming sustainability in all spheres of development**.

## Opportunity in the roads sector:

The roads sector plays a crucial role in promoting all-round development and is a harbinger of growth.

In the Himalayas, access to roads is fundamental for economic growth and development of livelihood.

To further the green growth agenda in mountain areas, it is important to transform the roads sector which is presently seeing a quantum leap through road upgradation, realignments and new construction.

However, the **traditional construction practice** of using bulldozers to roll the excavated spoils down the mountain slopes causing damage to mountain vegetation, farmlands, and other property, is a major issue that needs to be fixed.

This practice **results in unstable slopes** that subsequently cause landslides both at the mountain and valley sides.

Not only this, the process **results in repeated repair expenditure and monsoon maintenance** throughout the lifecycle of the road.

Moreover, **improperly designed cross-drainage structures** result in gully formations causing further damage to the slopes.

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The existing rural roads and border roads infrastructure in this region is only going to expand in the future.

This presents an opportunity for the policymakers to graduate from **traditional to “green road” construction policy and practices**.

These “green roads” would **prioritise sustainability, minimise environmental impact and promote biodiversity conservation**.

They would essentially **prevent destabilising the slopes** as repair and maintenance is both difficult and expensive.

And by transforming these practices, the IHR has an opportunity to showcase itself as a leader in mountain road construction practices.

### How would the ‘green roads’ be different?

**Environmental Friendly Road Construction (EFRC) techniques** from the neighbouring mountainous country of **Bhutan** provide useful lessons on how to construct green roads.

Hence, mainstreaming sustainability in the roads sector in IHR would entail that the construction practices are in harmony with the fragile mountain ecosystem by adhering to the **following eight policy directions**:

**The traditional “cut and throw” method is replaced with “cut and carry”:** The traditional “cut and throw” method, which causes severe damage to the valley-side vegetation cover and leaves the fragile slopes exposed to monsoon rains has to be done away with.

For this, bulldozers will need to be replaced by excavators. Excavators load the excavated materials onto waiting tippers to be transported to pre-identified spoil disposal sites. Transportation of cut material (instead of rolling it down the slope) will prevent damage to the valley side slopes while keeping the existing vegetation intact.

**Excavated surplus materials:** This will have to be **segregated for re-use** and the **remaining debris transported to suitable spoil disposal sites**. Boulders would be stacked during excavation to prevent useful materials from being thrown down the slope. This would also limit the need for quarries, to some extent, for road construction work.

**The road design and drawings:** would have to include locations of spoil deposits, barriers, walls, drainage points and other structures like crib walls, gabion walls and bio-engineering measures to be implemented.

**Cuts into mountain slopes are minimised:** especially where the slopes are fragile and prone to landslides, and part of the road width is made in fill — by constructing retaining walls.

**Tree felling:** This should be kept to a **minimum** and only those standing on the carriageway are to be felled.

**Cross-drainage structures** are located along natural drainage lines with provision for animal passage.

**Controlled blasting:** should be adopted to minimise damage to the hill environment and to prevent the slopes from being destabilised. This will also help in keeping the remaining slope intact and stable by preventing materials from damaging the valley side slopes. **Maintaining geological and geomorphological integrity** will be an integral part of greening the road construction processes.

**Trenches and barriers constructed from logs or boulders:** These should be at about 10-15 meters on the valley slopes and are to be used to arrest falling materials that invariably impede the water flows in the streams below and adversely impact the aquatic biodiversity.

### Advantages of green roads:

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Studies carried out in Bhutan indicate that their green road construction practices are a resounding success from both an environmental and a financial viewpoint. These green roads have the following advantages:

They are **not only better for the environment** but are **also cheaper** in the long run.

The **initial investments** during the first two years of construction are **undoubtedly higher** than in the case of a road constructed using traditional methods. But the higher level of investment is reflected in higher road standards and quality.

**Maintenance and monsoon restoration costs** are substantially **lower** over the total lifetime of the road.

The improved quality of the road also leads to lower vehicle operation costs, which has a significant positive impact on the economic benefits derived from the roads.

Stable slopes reduce construction-induced landslides, boulder falls and the need for expensive protective works, and reduced monsoon maintenance.

**Other economic benefits** are fewer road blockages, less stocking of essential supplies by communities, less damage to flora and fauna and less damage to private properties and cultural heritage sites.

While the implementation of these green road guidelines may appear to be expensive upfront, over the total lifetime of the road, they will prove to be cheaper especially due to the **reduction of maintenance costs**.

Implementation of the green roads policy in the IHR will contribute to a **resilient, environmentally-conscious and better quality road infrastructure**, benefiting both the community and the natural ecosystem.

Transforming the road sector in the IHR to promote the green growth agenda would **require political will and stronger coordination**, particularly between the planning, finance, forest, environment and roads departments.

**Multinational banks and other donors** can also incorporate these green guidelines to further strengthen the environmental safeguards in their lending processes for linear infrastructure development.

### **Conclusion:**

Green roads play a crucial role in achieving sustainable development in the Himalayas by minimizing environmental impact. The Centre, State and local communities together works for the sustainability of the Himalayas and other parts of the country.