

## Himachal becomes 1st state to introduce bio-engineering in road management

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Use of biological agents in engineering is the new mantra in road management in hilly terrains and Himachal Pradesh is leading the way. The hills along 25000 km of rural road are getting a makeover to check landslides and rain in erosion.  
"Bio engineering in road management involves plantation of trees, shrubs and grass in a certain configuration to check erosion. This, however, is different from afforestation. It's just not about planting trees but planting them scientifically to achieve the desired goal," says Mr John Howell, Director, Institutions, Development and Environment Consultant, United Kingdom.  
Speaking to The Tribune on the side-

lines of the Indian Roads Congress in Sector 5, Mr Howell said standard civil engineering relied on stone and concrete to lend support to the hills.  
"Though easy to predict, this is an expensive proposition, not viable in areas where the roads stretch on endlessly and an entire state is involved. Bio-engineering provides an answer to deal with this problem without burning a hole in the pocket of the state exchequer," he maintained.  
Explaining that the configuration of trees-shrubs-grass has to be worked out based on certain conditions, Mr Howell stated, "The bio-engineer needs to keep in mind the steepness of the slope, the soil of the hill, the climate of the area as also the rainfall pattern. All these factors together decide the vegetation needed to contain erosion and landslides."



Prof B.P. Chandrashekhra



John Howell

### Jute for durable roads

Under a latest experiment, the National Rural Roads Development Agency is using jute to strengthen the foundation of rural roads being made under the Prime Minister Gramen Sadak Yojna.  
"We have tied up with the Jute Geotextiles for use of jute in pavements, giving the roads a reinforcement affect to roads. This facilitates drainage of water from the sub layer. This water is responsible for maximum damage to the road. The fabric is embedded in the road at three different layers while the

top is coated with bitumen." Prof B.P. Chandrashekhra from the Ministry of Rural Development, Government Of India, said.  
While this would be launched from the five states of West Bengal, Assam, Orissa, Madhya Pradesh and Chhattisgarh, the department is also exploring the use of coir and is in dialogue with the coir board. For quality audit, the department is working on involving groups of villagers to check road quality in their village.

The cutting of roads in the hills disturbs their natural slope causing instability and making them steeper than the actual angle of repose. "Cutting of the slope makes it steeper beyond the angle of repose. That is what leads to frequent landslides. We plant the trees in a diagonal manner or lay small trenches," Mr Howell remarked.  
Plants chosen for plantation come from the local species and are essentially pioneer plants. "These are plants which can survive in dry soil, harsh sun and unstable weather conditions. The programme has been introduced in

Himachal Pradesh through the World Bank and it is likely to take off shortly," says this expert who has executed similar projects in Nepal, Bhutan, Laos and Pakistan among others.  
"Of my 20 years of work on the project, I have spent half the time executing it in Nepal where we have had very encouraging results. This technique was first used by China and subsequently travelled down to the Alpine countries of Switzerland and Austria before making its way to Asia and finally into India," he said.