

**Government of Nepal      Asian Development Bank**  
**Ministry of Physical Planning and Works**  
**Department of Roads**

## **Road Network Development Project**

**EHS Report No. 30**

# **ENVIRONMENTAL, HEALTH AND SAFETY MONITORING OF THE DAMAK - GAURIGANJ ROAD UPGRADING**

**August 2007**

# 1. ENVIRONMENTAL SITUATION

## 1.1 Background

This project involves the upgrading of 22 km of national feeder road F2, from the East-West Highway some two kilometres east of Damak at Padajung, southwards to the small bazaar of Gauriganj. Apart from a few small bazaars, the road runs through agricultural land, mostly used for paddy cultivation. Before the project, only the first 6 km were black-topped, and the rest was gravelled. Settlements were long-established with little recent in-migration, and there were few or no squatters. Some twenty-five years or so after construction, the road blended well with the landscape. Before the start of the project, Bazaar areas tended to be dusty or muddy, but much private property was clean and well-kept, and there is every reason to suppose that, as has already happened along other Terai feeder roads, upgrading and full black-topping of the road will lead to a far better appearance of built-up areas. This has exactly happened after the completion of the project.

The project's environmental baseline study was conducted in October 2004, before the mobilisation of the Contractors. At that time, the overall environmental conditions were described as appearing sound, with no major environmental issues observed.

Contracts were awarded in early 2005, and all Contractors were mobilised by June of that year. Following this, the first environmental monitoring study was conducted on 4 July 2005; the second on 19 February 2006; the third on 19 June 2006. Owing to the unrest in the Terai and a bandh called upon by the agitating groups on January 7 and 8, the fourth monitoring visit had been conducted very briefly on 7 and 9 January 2007. The fifth monitoring study (**this visit**) had been conducted on 16 August 2007. On that day, the Environmental Consultant was accompanied to the site by Mr BN Pradhan-the RE.

The project (as scheduled to be completed on April 2007) has now been completed and the contractors have fully been demobilised. However, the bioengineering works (grass plantation) along the rest 20% of the road embankment are being done.

## 1.2 Key issues

Our previous monitoring reports had highlighted various issues related to environment, health and safety during the construction stage. Since the project has now completed, some of those issues such as labourers' camps, health and safety of the labourers, material extraction and storing, risk to the local people from construction equipments and project related vehicles, etc. are no longer applicable at present. However, despite these, the two major environmental concerns that we had shown before the start of this project were i) drainage problem especially in the bazaar areas, and ii) the safety implications related to the raised embankments in the middle of a busy bazaar especially when the traffic speed will increase after DBST.

- 1 **Drainage.** Despite we deliberately selected the mid-monsoon for our monitoring to see whether or not there are drainage problems mentioned as above, it is good to see that there were nothing serious related to the cross-and side-drains. The concern of inadequate drainage provision especially at 10+500 and 21+800 that we have been raising in all our previous reports, has now been mitigated, and there is no problem whatsoever is evident at present. The box culvert at 4+450 and the pipe

culvert at the southern end of Gwaldubba bazaar (16+700?) have appropriately withhold the water discharge even in torrential rain.

- 2 **Traffic calming measures.** We had constantly highlighted the need to place traffic calming measures especially around the bazaars and schools (see EHS Report 18), but despite a few road signs, no such measures were found in this visit also. Why not the design permitted to place rumble strips or humps at the given locations, when they could be seen even in the East-West High Way and in other feeder roads, is a matter of surprise.

### 1.3 Other issues

As stated before, the environmental hazards related to Material extraction and crusher plants; Safety gear for workers; Labourer camps and related environmental matters, etc. are not applicable at present. Rather the environmental enhancements of this project such as the covered drains and full-width (14m) pavement in all the bazaar sites such as Gauradaha (10+400 to 10+590), Gwalduba (16+380 to 16+630) and Gaurigunj (21+500 to 21+806) along with bus bays are worth mentioning. Property access and a standard 15m DBST side access have rightly been placed.

### 1.4 Bio-engineering

Eighty percent of the bio-engineering works have been reported as complete. Grass plantation in the rest embankment was in progress during the monitoring visit. In majority of the places the plants-both brush layers and grass slips have established. However, some filling is essential where the cuttings have not rooted, and the slips died. In addition, at few places rain water has scoured the newly formed embankments which need repairing during the Defect Liability Period. Moreover, the dumping off of construction materials by the locals and keeping their livestock has also damaged the freshly planted road slopes. Neither the consultants nor the contractors could probably do any thing, unless the road neighbours themselves come forward to protect the road-their own property.

Interestingly, two people were found sowing the seeds of Black gram (*Vigna mugo*) at the road embankment some 7 km south of Padajung (0+000) where the grass has already established. Whether this crop damages or reinforces the road slopes is yet to be seen. If no problem identified later, such crops should be promoted.

## 2. DETAILED ENVIRONMENTAL, HEALTH AND SAFETY ISSUES MONITORED

Identified benefit	Baseline extent and severity (quantified indicators)	Checked extent and severity (THIS VISIT)	Enhancement measures	Responsibility for compliance	Timing of compliance schedule	Monitoring check schedule	Responsibility for check report
<b>Damak-Gauriganj road (a Terai feeder road): Part 1: Benefits and their enhancement</b>							
Upgrading of roadsides through bazaars.	There is no drainage or paving of bazaars: at least 360 m of bazaar roadsides lack drainage and 1920 m <sup>2</sup> lack paving (this also includes area for bus station).	In all the three bazaar areas paving has been done as wide as 14 m.	Have been applied effectively and satisfactorily.	The Contractors have complied as instructed by RE.	Complied in time.	Not applicable at present.	Checked and reported by consultant Environmental Specialist.
Improvement of environment where road passes close to religious trees and shrubs.	No specific sites identified before project, but local people may raise objections during construction period.	The small temple at km 18+830 was moved little far away from its original position to the left side.	Not applicable at present.	Not applicable at present.	Not applicable at present.	Not applicable at present.	Checked and reported by consultant Environmental Specialist.

Identified hazard	Baseline extent and severity (quantified indicators)	Checked extent and severity (THIS VISIT)	Mitigation measures	Responsibility for compliance	Timing of compliance schedule	Monitoring check schedule	Responsibility for check reports
<b>Damak-Gauriganj road (a Terai feeder road): Part 2: Hazards and their mitigation</b>							
Confrontation with local residents following road widening, in all settlements where roads are too narrow to carry a full width feeder road.	Nine settlements and three bazaars with no evidence of latent confrontations.	No problems in this respect were observed in this visit.	Not applicable at present.	Not applicable at present.	Not applicable at present.		Checked and reported by consultant Environmental Specialist.
Material extraction sources give rise to erosion, loss of land or downstream problems in water courses.	Material sources were not yet identified.	Three rivers (Chisang, Mauwa and Ratuwa) environmentally acceptable for material extraction, had not been visited at this time.	Not applicable at present.	Contractor have extracted materials strictly following the provisions of the contract, and fulfilled their responsibility.	Not applicable at present.		Checked and reported by consultant Environmental Specialist.
Haulage of materials through Damak and other bazaars causes a temporary increase in traffic levels and associated disruption.	Not applicable.	Not applicable at present.	Not applicable at present.	Not applicable at present.	Not applicable at present.		Checked and reported by consultant Environmental Specialist.
Crushing of materials causes noise and dust pollution.	Not applicable.	Not applicable at present.	Not applicable at present.	Not applicable at present.	Not applicable at present.		Checked and reported by consultant Environmental Specialist.
Discharge from drains may flood roadside agricultural land.	Virtually no drainage, so no impacts from outfalls.	No visible problem related to drain discharge particularly in habitations were seen at present.	Proper mitigation measures have been applied.	The Consultant Engineers and the Contractors have fulfilled their responsibility.	Not applicable at present.		Checked and reported by consultant Environmental Specialist.
Inadequate cross-drainage will lead to extensive upslope flooding once the embankment is raised during project construction.	Low existing road is frequently over-topped after heavy rain.	No problems related to drain discharge were seen	Proper mitigation measures have been applied.	The Consultant Engineers and the Contractors have fulfilled their responsibility.	Not applicable at present.		Checked and reported by consultant Environmental Specialist.
Raised embankment will lead to difficulties and dangers in wide bazaar areas at km 10+500 and 21+800.	Not applicable.	Although, the locals are not complaining of such raised road surfaces in the bazaars, but they think that such road surface might cause accident to the bicyclists.	The limited engineering design does not permit a level surface in these bazaars; however appropriate traffic calming measures must be in place even after black topping of the road.	RE to review site requirements and place traffic calming measures.  Contractor to implement works as instructed by RE.	By the end of DLP.		Checked and reported by consultant Environmental Specialist.
Raised embankment will lead to problems of access at intersections with small tracks and paths.	Not applicable.	No problems in the intersections have been observed.	Access points are well located.	The Consultant Engineers and the Contractors have fulfilled their responsibility.	Not applicable at present.		Checked and reported by consultant Environmental Specialist.
Erosion of raised embankment slopes, especially when newly formed.	No significant erosion features were visible during pre-project survey.	Only at few places, the embankment slopes have been disturbed due to rain, dumping off	Bio-engineering measures (mainly grass planting, turfing or brush layering) will be used to repair	Contractors to repair bio-engineering works.	Works to be completed during DLP.		Checked and reported by consultant Environmental Specialist collaborati

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