Government of Nepal **Asian Development Bank**

Ministry of Physical Planning and Works

Department of Roads

Road Network Development Project

EHS Report No. 31

ENVIRONMENTAL, HEALTH AND SAFETY MONITORING OF THE

BIRATNAGAR - BARDANGA; URLABARI - BARDANGA ROADS UPGRADING

August 2007

1. ENVIRONMENTAL SITUATION

1.1 Background

This project involves the upgrading of 66 km of national feeder road from the East-West Highway at Urlabari which is about 6 km west of Damak. From Urlabari the road heads 26 km southwards to the small bazaar of Bardanga then about 40 km west to Biratnagar.

Apart from a few small bazaars, the road runs through agricultural land, mostly used for paddy cultivation. Settlements were long-established with little recent in-migration, and there were few or no squatters. Bazaar areas tended to be dusty or muddy, but much private property was clean and well-kept. 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.

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. The first monitoring visit was conducted on December 2005; the second on June 2006; the third on 21 and 23 January 2007; and the fourth **(this)** on 18 August 2007.

Contracts were awarded in early 2005; and mobilised by June of that year. At the time of this monitoring visit, DBST of the first 22 km of road from Urlabari Chowk to Ambari Chouk has been completed. And on the Biratnagar - Bardanga section, sub-base, and capping were being laid intermittently, with a small section towards the west of Ambari Chouk having DBST.

During this monitoring visit, as had happened during the third visit on January 2007, the security situation in the Terai was a bit tense. And, a kind of psychological barrier remained all the time during the site visit. Stopping the vehicle at various locations at will was out of question.

1.2 Key issues

There are no major environmental issues in this road sector. On this monitoring visit also, instead of searching for new environmental issues, attempt has been made to see whether the older issues that were highlighted previously, had been addressed. Those issues that required attention by the project staff were:

1 **Traffic calming measures.** Despite our repeated request the speed control measures of any kind have not been placed so far. Public transport as well as contractor's tippers were seen moving in higher speed at black-topped surface. At various locations, local people were sitting leisurely covering almost half of the paved surface. Considering the mode of road use by both the road neighbours and vehicle drivers, the chance of happening road accident has greatly increased.

2 **Segregation of work area.** The EHS Report 19 had stated that the road works must be properly marked, and as a basic minimum, white-painted stones would be acceptable (as an alternative to the cones required by DoR's Code of Practice) on a low traffic road such as this. No such measures were observed this time also.

3 The lack of precautionary measures for the health and safety of labourers remains largely unaddressed. Even basic safety equipment is absent in almost all cases.

4 Material extraction sites had not been visited this time.

5 Even in this monsoon, drainage at the bazaar areas do not seem a problem at present.

6 Bioengineering works (turfing, and plantation of grass slips and cuttings for brush layering) are of high standard. Almost all of the planted ones seem established; grasses have started seeding.

7 Environmental enhancement has been achieved through the full-width pavement and covered side drains in all bazaar areas.

1.3 Summary of environmental issues

The following issues are highlighted; details are given in the tables in the next section.

Drainage. At present, there seems to be no problems as covered drains have been constructed in bazaar sites, which at present look fairly good.

Bazaar sites. Although, there is a lack of nearby natural outfalls for the drains in majority of bazaars the cross and side drains were observed this time not posing major problems of water discharge. However, there is a serious safety implication in having a raised embankment in the middle of a busy bazaar. This situation has remained unchanged because of the approved engineering design.

Dust nuisance. No dust was observed this time simply because the road surface was wet due to monsoon. As soon as it is over, there will be a dust nuisance especially in the bazaar sites between Bardanga and Biratnagar section. In this monitoring visit, the Engineers and the Contractor's representative have been requested to spray water at bazaars and at sites were there are labour gangs.

Local labourers. The efforts of the Contractors to draw most of their unskilled labourers from nearby settlements are noted and appreciated. This helps to reduce the evil impacts of work camps. Very few labourers were found working at the site. They have been placed in rented houses, which could not be visited this time. According to the labourers, such houses are okay.

Materials. A huge pile of aggregate had been stocked besides the crusher plant at Chisang Khola, and is being tipped to the construction sites as per need. Extraction of the materials from the rivers is reported to be stopped.

Personal safety. In every monitoring visit, we kept on pointing out that the contractor had provided very little basic safety gear to his workers. During this monitoring visit also, no labourers at the site had any such protective clothing. This must be taken seriously and the appropriate clothing and equipment provided.

Traffic safety. During the construction stage at least, two fatal accidents had been reported from Urlabari-Bardanga section. Once, the Contractor's truck crushed a pedestrian to death, and the next time a passenger fell from the roof of a public transport. Perhaps, this could have been avoided if the traffic speed were limited.

As usual, the road neighbours have been using the road very casually as if they are the only on the road. In such situation, there could be no other option than to limit the speed.

Demarcation of the working area. There was no demarcation between the roadway for traffic and the areas for working in Ambari-Biratnagar section.

1.4 Bio-engineering

Bio-engineering works, mostly grass line plantation and brush layering, look quite impressive. The embankment from Urlabari to Bardanga is well set with grass turf. The growth of grass line planted along the embankment is very good and it has started seeding also. However, at few places they have been destroyed due to haphazard dumping-off of construction materials, and scouring by this monsoon rain. Such sites, need repairing. Sketch of recommended bio-engineering treatment on slopes have been given below.

Timing of works. Rest of bio-engineering works at Ambari-Biratnagar section was being done in good time and is expected to grow well as in the Urlabari-Bardanga section.

Protection of plants. No separate means to protect the bioengineered plants have been placed. It is the contractor's responsibility to protect new sites for one year (see conditions of contract). The consultant's Bio-engineering Specialists will assess the sites in the days to follow.

Sketch of recommended bio-engineering treatment on slopes less than 3.0 metres (i.e. most newly formed earth embankments)

Sketch of recommended bio-engineering treatment on slopes longer than 3.0 metres (i.e. around culverts and on bridge approaches)

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	Respons for che and rep
Terai feeder roads (Biratnagar-Bardanga; Urlabari-Bardanga roads): Part 1: Benefits and their enhancement							
Increased areas for the grazing of cattle tethered on embankment slopes.	Embankments regularly used by 200 tethered cattle grazing along approximately 15 km of road before project.	The embankments slopes from Urlabari-Bradanga have well established plants and the rest is being planted with prescribed species.	All embankment slopes will be grassed with robust but palatable species to prevent erosion and permit controlled grazing, once they have been raised.	Contractor to implement works as instructed by the Bio-engineering Specialist.	By the end of implementation. Works to be completed as per schedule.	To be checked every four months throughout project implementation.	Checked a reported b consultant Environme Specialist
Provision of shade trees to improve the environment for road users.	At 30 sites, 49 religious trees (Bar and Pipal) with more or less equal number of other trees such as Mango, Guava and Jackfruit were present before project. 15 km of the RoW has potential for tree plantation.	No change from the baseline or tree felling reported as required during widening.	Since road neighbours graze cattle on embankment slopes, the planting of trees densely is not really appropriate. Nonetheless, few trees have been reported to be planted at appropriate sites. However, all other existing trees will be preserved.	Contractor to implement works as instructed while abiding by contract clauses that forbid damaging trees.	Throughout implementation.	To be checked every four months throughout project implementation.	Checked a reported b consultant Environme Specialist
Upgrading of road helps increase traffic volumes.	Vehicles plying on road counted during pre-project survey. (See Baseline Survey Report).	Traffic level has considerably increased; local three-wheelers, jeeps and buses have started to ply.	Black-topping in the first 22 km has been completed to provide a much better ride quality. Work is on progress for the rest.	Contractor to implement works as instructed by Resident Engineer.	By the end of implementation.	To be checked every four months throughout project implementation.	Checked a reported b Traffic and Safety En of RNDP.
Reduction of stagnant water in old roadside borrow pits, currently giving rise to an increased risk of mosquito-borne diseases.	Approximately 50% of the road length has depressions that become waterlogged during rain. About 2500 m of road is affected by dry season stagnant water in borrow pits.	Road surface has been appropriately raised to avoid water logging.	Where possible, simple sluices will be cut in the walls of borrow pits to permit drainage outside the monsoon and jute retting seasons.	Resident Engineer to identify problem areas during the dry season and instruct the Contractor; Contractor to implement works as instructed.	By the end of implementation. Works to be completed as per schedule.	To be checked every four months throughout project implementation.	Checked a reported b consultant Environme Specialist
Upgrading of roadsides through bazaar, and bus station.	Seventeen bazaar areas with about 15,180 m^2 of bazaar roadsides (which also	Full-width pavement along with covered side drains have given the bazaars a	Speed control measures are essential.	Resident Engineer to review site requirements and propose more drainage, paving	By the end of implementation. Works to be completed as per	To be checked every four months throughout project	Checked a reported b consultant Environme Specialist