

ADB Nepal, ADB Nepal, Secondary Towns Integrated Urban Environmental Improvement Project for Asian Development Bank, Manila (36188 Nepal 2010 Cat B):

Dr David Green was Environmental Team Leader providing environmental assessment and advising the ADB's South Asia Department SATC and Nepal's Department of Urban Development and Building Construction, Ministry of Physical Planning and Works. The overall objective was to improve quality of life and help achieve higher and socially inclusive economic growth in key regional centers such as Biratnagar, Birgunj and Butwal, through improved and affordable municipal services on the basis of (i) economic growth potential, (ii) demands for urban services, and (iii) urban management capacity. Each town is a main urban centre or an industrial corridor of importance in external trade.

Tasks included - leading the environmental work stream, monitoring air quality and noise and compiling EARF and IEE in line with ADB environmental guidelines and Nepal's Environmental Protection Rules. Environmental Management Plan (EMP) for monitoring the construction and operations was also completed to provide guidance to ADB based on internationally recognized criteria and ADB standards. A methodology was established and tools developed to enable rapid but sound assessment of the emission impacts of transport projects using readily available equipment and data.

The field work took place in Biratnagar, a city on the southern border of Nepal, with an inner city environment featuring densely packed commercial / residential areas next to the main arterial north south highway leading to the Terai and all points east, west and north. Noise and air quality parameters were measured and physical conditions observed over several weeks to create an environmental baseline. The environmental workstream focused on mapping key environmental pollution sources and identifying typical traffic and other fixed pollution sources. Key locations were selected across a variety of inner city and urban fringe development scenarios to establish the range of prevailing environmental conditions.

The absence of up-to-date laboratory facilities and the variety of external complicating factors made the use of portable grab and high-volume sampling in and near streets and highways a suitable option. Noise and air quality were compared at several intervals in multiple locations to establish the array of urban environmental circumstances. Repeat sampling using simple methods facilitated a clear impression of the environmental conditions in and around Biratnagar City. Dust in the air was the main pollutant and particulate matter dominated the environmental portrait along the Biratnagar corridor with values often found above statutory safe limits. Sampling was at or near street level and this focus indicated the worst direct and impacts affecting people in their daily routines in the markets and street side shopping areas.

Alternative routes for through traffic and alternative transport modes were suggested in the highest trafficked areas, establishing potential means to allow traffic to be moved away from people in the most congested and polluted areas. The conclusions were:

(i) Particulate matter was most dominant environmental hazard with values often found above internationally acceptable safe limits.

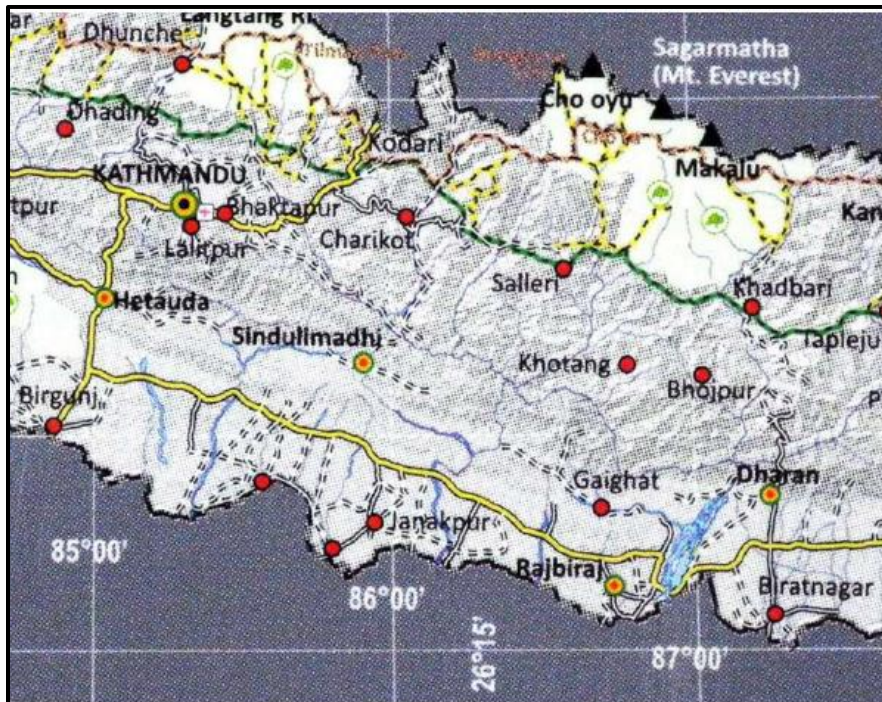
(ii) Air quality parameters generally exceeded air quality standard limits proposed by the national ambient air quality standard 2004 (NAAQ) particularly with respect to prevailing concentration of the TSP, PM₁₀ and PM_{2.5} in many of the locations examined. Concentration of SO_x were unusually and potentially critically high; suggesting immediate intervention should be considered.

(iii) Carbon monoxide, oxides of nitrogen and lead were not considered as the major environmental burden of the corridor as their concentration were at sampling occasions found below the maximum allowable concentration. However, the observed concentration of the SO_x in many locations during the third phase of monitoring were found many times higher than the recommended NAAQS limit; an important environmental hazard of this industrial corridor.

(iv) The noise levels measured in some locations of the corridor were found above the maximum allowable limit proposed for ensuring public health including hearing impairment. Continuous exposure of population was identified potentially to cause certain health problems and hearing damage to the exposed population. Prevailing noise pressure level in other locations of the corridor, though not enough to cause direct health hazard, were high enough to create sleep disturbance, interference with hearing speech and social discomfort to the local people.

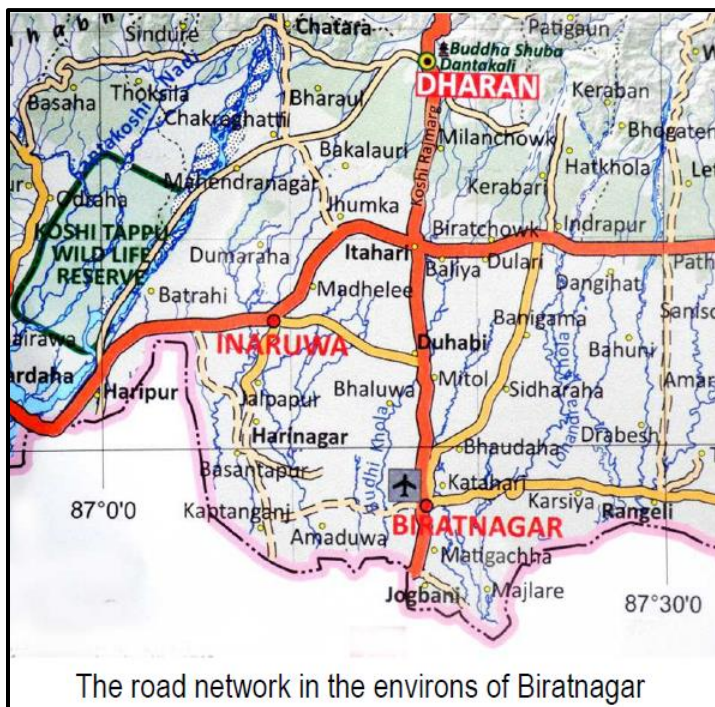
(v) The major sources of pollution of the corridor, for both air and noise, are the industries and vehicles. Pollution level further aggravated by the domestic fuel consumption, commercial activities as well as fugitive dust emission especially from the roads.

Location Birat 260kmSE Kathmandu



The location of Biratnagar (bottom right) within Nepal, approx. 240km southeast of Kathmandu

Road Network



The road network in the environs of Biratnagar

Intense land use and canyon streets



The intensity of land use in the central part of BSC varies widely. Relatively high-intensity commercial land use is directly adjacent to low-intensity land use, e. g. for storage of construction materials. Low-quality shops encroach on the right-of-way of this inner-city street. Traffic density is still fairly low, with a high percentage of non-motorised transport

Major N-S highway adjacent to City Centre



Large industries are located just outside the welcome gate that marks the northern boundary of BSC