

CHAPTER I

INTRODUCTION

The name "Kathmandu," is the capital city and one among 75 districts of Nepal. Simultaneously it is known as a valley which covers three districts - Kathmandu, Lalitpur and Bhaktapur. One of the main public health problem facing Kathmanduites is air pollution created by motor vehicles. There are more than 110,000 vehicles run within 943 km. road of Kathmandu valley. Specially these vehicles are crowded on 394 km. city road. Because of valley type of geographical structure, permission of old engined vehicles to run, supply and use of leaded and low quality fuel, poor condition of road and speedy rise in the vehicle number are the responsible factors to increase the air pollution level in Kathmandu valley.

The main pollutants of air pollution by motor vehicles are Sulphur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Suspended Particulate Matter (SPM), Carbon Monoxide (CO) and Lead (Pb).

NESS (P) Ltd. conducted a survey on the respirable air particulate PM 10, in Kathmandu municipality in the month of October / November, 1993. The findings indicate very high potential of PM 10 over the urban streets and in the residential areas at respirable height of 1.5 m. The study has shown nearly 2-6

times higher PM 10 dust particulate concentration than the normally accepted level of 70 µg/m³ set by WHO. (NESS, 1995).

The total length of road in the valley is 943 km.(DOR,1995). Among them, the length of the city road in Kathmandu valley is only 394 km of which 255 km. is Black topped, 95 km. is Gravelled and 44 km. is Earthen. Till June 1996, there are more than 110,000 vehicles registered in the Bagmati Zonal Transport Management Office. However, in the country as a whole have only 162,000 motor-vehicles till 1996 Feb. Among the total vehicles registered in the country, more than 60 % vehicles registered and run within the Kathmandu valley.

The vehicle emission is tested in Zonal Transport Management Offices and Traffic Police Offices. Up to mid-June 1997, Valley Traffic Police Office conducted pollution tests on a total of 41,952 of which only 25,554 vehicles passed and secured green card. After noticed to Valley Traffic Office that even the vehicles with green cards were emitting clouds of black smoke, they initiated the surprise checking at different spots and 2094 vehicles out of 2719 failed on re-test. Besides, all of the diesel tempos (Three wheeler) that underwent the test failed. The diesel tempos have inefficient engine in terms of pollution control and they are also lacking regular servicing and maintenance. Lack of seriousness about the maintenance of vehicles, repaired at a cheap price or just for formality of maintenance can not bring down the level of emission.

Green stickers for passenger vehicles and tourist vehicles are valid for 6 months. While the validity is 1 year in other type of vehicles. A vehicle that fails in the test will have to try again (after waiting minimum 15 days) for the green sticker with necessary repairing of vehicle. The provision for vehicle test is existed but the lack of legislation no action have been taken against such vehicles which fails in several tests.

According to fuel use, the vehicles could be divided into two categories, i.e., diesel and petrol vehicles. All the motor-cycles and most of the tempos and car, jeep vans are petrol engined. Out of the total vehicles (109,566) registered till July,1996 in Bagmati zone (Kathmandu), petrol-engined vehicles number are more than 95,000. Petrol engined vehicles emits carbon monoxide (CO) and Lead pollutants. All of these petrol engined vehicles are used leaded fuels because there is no restriction to supply and use of such fuels. Hence, according to the consideration on the number of petrol vehicles and using practices of leaded fuel, the problem of lead pollutant might be higher in Kathmandu valley than other pollutants. The main consequences of lead pollutant is to impair the normal intellectual development and learning ability of children.

Necessities of public transport services is growing day by day in the urban areas of Kathmandu valley. Mainly such demands are fulfilled by diesel and petrol based vehicles. The increasing trend of import and use of such fuels effects adversely to the balance of trade as well as environmental condition of the nation.

Nepal has big potentiality of hydro-electricity. Environmentally and economically it would be quite useful to the application of electric-run motor vehicles. The existing Trolley bus service (13 km.) between Tripureswore (Kathmandu) and Suryavinayak (Bhaktapur) is successfully running. To substitute the imported fuel and to conserve the environment to some extent, the extension of electric based public transport service system would be more advantageous. But because of lack of adequate resources to finance, it is not feasible in recent times. Hence we have to improve the efficiency in existing transport services and apply the stepwise control measures to use Leaded fuel and phase out old vehicles.

Among the various air pollutants, created by motor vehicles in Kathmandu valley of Nepal, the lead pollutant has become more serious. Hence, I have determined in this study to observe the blood Lead level of childrens of public school in Kathmandu valley. At the same time, here I would like to propose to measure the blood lead level in non-exposure area to compare the prevalence of exposure.

Table - 1.1

1.1. A Brief Overview of Nepal and Kathmandu valley.

S.N.	Component	Nepal	Kathmandu Valley
1.	Location	Latitude 26 22' N to 30 27' N Longitude 80 4' E to 88 12' E	Latitude 27 22'N - 28 50' N Longitude 85 15'E - 85 32'E
2.	Border	China in the North, India in the South, East and West.	Nuwakot and Sindhupalchok districts in the North, Makawanpur in the South, Dhading in the West and Kavre in the East.
3.	Altitude	Varies from 70 m. to 8848m.	City lies about 1325m. above mean sea level and surrounded by high

			mountains (> 2000m.)
4.	Area	147,181 sq.km.	900 sq.km.
5.	Length and Width	885 km. East to West. Non uniform, mean width 193km.	-
6.	Administrative and Physical Division	Development Region - 5, Districts-----75, Municipality-----58 VDCs-----3912	Development Region- - Districts-----3 Municipality----- - VDCs-----
7.	Climate	Tropical, Mesothermal, Micro-thermal, Taiga and Tundra,	Temperate,
8.	Ecological Division	Mountain, Hill and Terai,	Valley,
9.	Temperature	Max.- 43.7 C., Min. - -6.1 C.,	Max - 36.6 C., Min - -2.2 C
10.	Population	18,491,097 (1991) 22,474,000 (1996) 37,748,000 (2020)	1,105,379 (1991) 1,308,798 (1996) 1,519,974 (2001)
11.	Density of Population /sq.km.,	160. (1996)	-
12.	Population Growth Rate.	2.08 % (1991) 2.50 % (1996)	-
13.	Households	3,328,721 (1991)	201,038. (1991)
14.	Average H. H. size	5.6	4.94
15.	Urban Pop.	9.2 % (1991) 14 % (1995)	-
16.	Economy	Contribution of agriculture to GDP.....40.22 % Contribution of Non agriculture to GDP.....59.78 %	-
17.	Language	Nepali-----50.3 % Maithili-----11.8 % Bhojpuri----- 7.5 % Tharu-----5.4 % Tamang-----4.9 % Newar-----3.7 %	-
18.	Religion	Hindu-----86.5 % Buddhist----- 7.8 %	-
19.	Crude Birth Rate	37.2 /1000	-
20.	Crude Death Rate	12 /1000	-
21.	Total fertility	5.1	-

	rate		
22.	Infant mortality rate	90 /1000	
23.	Age of 0-14	42. %	27.49 %
	60+	5. %	5.94 %
	65+	3. %	-
24.	Dependency ratio	84.	63.96
25.	Zonal Transport Management Office	12	1
26.	Total number of vehicles,	July 1996 - - Feb. 1996 - 162749. July 1997 - -	101,260. - 109,566.
27.	Lengths of Road	10724 km. (July, 1994)	943 km. (July,1994)

Source :Nepal Living Standard Survey Report, 1996. CBS/NPC/HMG,Nepal.
(15,16,23 and 24)

: UN / ESCAP Population Data Sheet,1996. (All information indicated in 1996)
(10, 11, 12, 13, 14, 19, 20, 21, 22)

: Statistical Pocket Books, CBS / NPC, 1988,1990,1992, 1994 and 1996.
(1, 2, 3, 4, 5, 6, 7, 8, 9, 17, 18, 25, 26, 27)

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