

APPENDICE

APPENDIX A

**Questionnaire on Health Effects of Lead Pollutant to the Children
(6-10 Yrs.) of Public School in Kathmandu Valley of Nepal,**

ID-----School-----Date -----

Part I: Background Information of the Children

Name ----- Family name----- Sex -----M / F

Birth date -----Month -----Year -----

Age -----Year -----Month; Weight-----Kg; Height -----cm,

House no.----- Ward no----- VDC / MC-----District -----

Name of interviewee ----- Family name -----

Relationship with the child ----- Mother / Father / Brother / Other

Interviewer -----Family name -----

Please mark (x) in the box of correct response or fill in the gap as required,

Part II: Past Health History of the child

1. Birth Weight -----Kg. 2. Birth Order -----

3. Duration of pregnancy 1. Full term,

2. Pre-term

3. Post term

4. Condition immediately after birth
1. Cry: No Yes
2. Colour: Blue Or pale pink
3. Activity: Lethargic Active

5. Neonatal condition
0. Normal
1. Physiological jaundice
2. Incubator treatment
3. Diarrhoea
4. Respiratory tract disease
5. Others, Specify -----

6. Health problems within last 3 months, please specify the duration

<u>Symptom</u>	<u>No</u>	<u>Yes</u>	<u>Times / month</u>
Headache	0. <input type="checkbox"/>	1. <input type="checkbox"/>	Times / month-----
Stomachache	0. <input type="checkbox"/>	1. <input type="checkbox"/>	Times / month -----
Constipation	0. <input type="checkbox"/>	1. <input type="checkbox"/>	Times / month -----
Convulsion without fever	0. <input type="checkbox"/>	1. <input type="checkbox"/>	Times / month -----
Respiratory problems	0. <input type="checkbox"/>	1. <input type="checkbox"/>	Times /month -----

7. During the past 3 months, was the child pale (anemic) ?

0. No Yes

8. During the past 3 months, had your children had any urinary problem ?

0. No Yes

9. During the 3 months did you have to hospitalise take your child ?

0. No 1. Yes, specify for what problem and how long ?-----

Part III: Behaviour of Children During the Past 3 Months

(0) Never (1) 1-2 times / week (2) 3-6 times / week (3) >6 times /week

(0) (1) (2) (3)

1. Have you ever buy curry or food for your children from open street shop (0) (1) (2) (3)
2. Did the child wash his / her hands before eat ? (0) (1) (2) (3)
3. Does the child sit or lay down while he / she eat food ? (0) (1) (2) (3)
4. Does he /she go outside while he is eating ? (0) (1) (2) (3)
5. Does the child have snack or not ? (0) (1) (2) (3)
6. Does the child eat non eatable substance ?
 0. Never 1. Sometime, Specify -----2. Daily, Specify -----
7. Does the child play in the ground ?
 0. Never 1. Occasionally 2. Almost everyday 3. Everyday
8. What kind of things do your child use when he plays outside the house ?
 0. Never plays outside the house (Go to no.15,)
 1. Running with friend with gun
 2. Walking
 3. Play with small stone, dust
 4. Play with animal
 5. Play with other children in the garden
 6. Bicycle / Tricycle riding
 7. Others, Specify -----

9. How long time in a day does the child play outside the house ?

1. < 1 hour 2. 1-2 hours 3. 2-4 hours
 4. 4-6 hours 5. 6-8 hours 6. > 8 hours

10. How much dirty would he be when he / she come back home after playing ?

0. No 1. A little 2. Medium 3. Very much

11. Does your child have the habit of putting the finger, pencil or something else in mouth ?

0. Never (Go to no. 13) 1. Occasionally
 2. Almost everyday 3. Everyday

12. Is the things clean or not, if he / she put in mouth ?

0. Never clean 1. Sometime
 2. Always 3. Everyday

13. What is the source of drinking water in your home ?

1. Pipe water 2. Ground water
 3. Mineral water 4. Other, Specify -----

14. How do you purify water before drink ?

0. Never 1. Boil 2. Filter 3. Others, Specify -----

15. Where do you store water for household purpose ?

0. No 1. In iron tank / bucket 2. In cement tank
 3. In brass pitcher 4. In plastic bucket 5. Others, Specify -----

16. Do you have any pet (dog, cat, bird) in your house ?

0. No (Go to no. 24) 1. Dog with short hair, 2. Dog with long hair,
 3. Cat, 4. Bird, 5. Others, Specify -----

17. Condition of pet,

1. Clean, 2. Dirty, 3. Very dirty,

18. Does the child touch and play with pet ?

0. No 1. Sometimes

2. Almost everyday 3. Everyday

19. Does the child sleep with the pet ?

0. Never 1. Sometimes

2. Almost everyday 3. Everyday

20. Is your child nose breather or mouth breather ?

1. Mouth 2. Nose 3. Both 4. Don't know

21. Where does your child sleep most of the time ?,

1. On the ground 2. On the floor with bed sheet 3. On the bed

22. In an average, how many hours/day does the child remain outside the house ?

0. Never (Go to no. 24) 1. < 1 hour 2. 1-2 hours

3. 2-3 hours 4. 3-4 hours 5. > 4 hours

23. What kind of vehicle does your child mostly use ?

1. Walk 2. Ordinary bus 3. Bicycle, motor cycle, tricycle

24. How long it take for the child to reach to his school ?

- 1.1. < 1 hour 2. 1-2 hours 3. 2-3 hours

25. Location of house from the busy road,

1. Connected with busy road 2. <10 metre

3. < 20 metre 4. > 20 metre

26. Does your child have any of the following behaviour problem ?

0. No 1. Yes

Behaviour (0)No (1)1-2 time / week (2)3-6 times /week (3) > 6 times / week

A. Lack of concentration

B. Aggresiveness and quarelling

with other children

C. Weakness in learning

D. Forgetfulness

Part IV: Family Information

1. No of family member-----Person

2. Who take care of the children Place Time

(Answer more than 1) 1. Inhouse 2. Other place 1. Day 2. Night 3. Sun-Sat 4. Mon-Fri

1. Mother / Father

2. Grand mother / sister

3. Care taker

4. Child care centre

5. Nursery

3. Age of mother -----Year

4. Age of father -----Year

5. Age of Care taker -----Year

6. Status of mother and father

1. Live together 2. Separate 3. Divorce 4. Widow

7. Education of -----	1. Father	2. Mother	3. Guardian
0. Illiterate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. 1-7 grade/ primary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. 8-10 / secondary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Graduate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Master and above	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Income generating ccupation of	1. Father	2. Mother	3. Guardian
0. No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Farmer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Employees (worker)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Employees (Secretary)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Government Officer / Company Officer/ Business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Private Business/ Shopkeeper	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Income of family mother / father, estimate -----Rs./ month

10. Does any of your family member including you work in the following places ?

0. No (Go to no. 12)

	1.Father	2. Mother	3. Guardia	4. Others, Specify
1. Lead exposure factory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Printing press	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Iron product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Driving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Traffic police	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Painting colour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Petrol pump	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Car repair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Photocopy shop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Other, Specify -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. In the past, who of the family were worked in the following places ?

(You can choose more than 1)

0. No (Go to no 12)

	1. Father	2. Mother	3. Guardian	4. Respondent
1. Lead exposure factory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Printing press	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Iron product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Driving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Traffic police	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Painting colour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Petrol pump	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Car repair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Photocopy shop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Other, Specify -----	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. If anybody of the house member worked in lead pollution area,

12.1. Is the dust or smoke cover body ?

0. Cannot see 1. A little bit 2. Medium 3. More

12.2. Do you change your dress after coming back from work ?

0. Never 1. Sometimes
 2. Almost everyday 3. Everyday

12.3. Is your working dress to be washed and iron or not ?

0. Never 1. 1-2 time / week
 2. 3-4 time / week 3. Everyday

12.4. Do you take bath after being back from work ?

0. Never 1. 1-2 time / week
 2. 3-4 time / week 3. Everyday

12.5. Have you ever played with children while you are wearing working dress of your factory ?

0. Never 1. 1-2 time / week
 2. 3-4 time / week 3. Everyday

12.6. Where do you keep your shoes that you use while going to work ?

1. Workplace 2. Out of house
 3. Separate place in house 4. Anywhere,

Part V: Environmental and Living Condition

1. Living condition characteristics

1. Single house 2. Joint house 3. Building / Apartment
 4. Flat / Condominium, floor ----- 5. Slum

2. Living place -----Floor

3. Characteristics of living place

1. Wood 2. Cement 3. Wood and Cement

4. Condition of paint chips 0. No 1. Yes
- 4.1. Bedroom of children 0. No 1. Yes
- Old paint chips 0. No 1. Yes
- 4.2. Playing room 0. No 1. Yes
- Old paint chips 0. No 1. Yes
- 4.3. Kitchen 0. No 1. Yes
- Old paint chips 0. No 1. Yes
- 4.4. Bathroom 0. No 1. Yes
- Old paint chips 0. No 1. Yes
- 4.5. Sitting room 0. No 1. Yes
- Old paint chips 0. No 1. Yes

4.6 Have you ever seen the children take the paint chips in their mouth ?

0. No 1. Yes

5. Duration of living place -----Year

6. Children's duration of living ----- Year -----Months

7. Distance of living place from road -----metre (From the gate of house)

8. Do you have fruite farming for yourselves ?

0. No 1. A little bit 2. Medium 3. More

9. How many time do you clean your house ?

0. 0-1 times / week 1. 2-4 times / week

2. 5-6 times / week 3. > 6 times / week

10. How many times do you clean your floor of the house ?

0. 0-1 times / week 1. 2-4 times / week

2. 5-6 times / week 3. > 6 times / week

11 How many time do you wash your floor ?

0. 0-1 times / week 1. 2-4 times / week

2. 5-6 times / week 3. > 6 times / week

12. How do you clean your house ?

0. No 1. Only remove the dust 2. Clean the floor

3. Clean the floor by using cloths

4. Clean the floor by using cloths and water

5. Clean the floor with using chemical and water.

13. Hygienic condition of living place,

1. Clean 2. Not clean / dust

14. Eating place,

1. On the floor 2. On the carpet

3. On the table 4. Other, Specify -----

15. Kinds of rice cooker

1. Aluminium 2. Stainless 3. Glass 4. Electric cooker

5. Ceramic 6. Others, Specify -----

16. Kinds of curry cooker,

1. Aluminium 2. Stainless 3. Glass 4. Electric cooker

5. Ceramic 6. Others, Specify -----

17. Curry container,

1. Aluminium 2. Stainless 3. Glass 4. Electric cooker

5. Ceramic 6. Others, Specify -----

18. Water container,

1. Aluminium 2. Stainless 3. Glass 4. Electric cooker

5. Ceramic 6. Others, Specify -----

19. Do you use traditional medicine for children ?

0. No 1. Always 2. Sometimes, Specify -----

20. What kind of powder do you use for your children ?

0. Never use 1. Dry powder 2. Water / liquid

3. Chinese powder 4. Others, Specify -----

21. Kind of playing material of children,

1. Wood 2. Plastic 3. Iron, Specify-----

4. Others, Specify -----

22. Quality of playing material of children,

0. No 1. Not toxic 2. Others, Specify -----3. Don't know,

23. Smoking habit of family member,

0. No 1. Yes, Specify-----

24. Is the living place of children relatively near from lead poisoning place ?

0. No 1. Yes, Specify -----metre.

25. In your family, do anybody use the lead contained chemical ?

0. No 1. Yes, Specify ----- 2. Don't know

26. Since the birth of children, have you repaired your house ?

0. No (Go to no. 6) 1. Yes, If yes, please answer,

26.1. When, the age of children -----Year -----month

26.2. Who repair ?

1. Self 2. Contractor 3. Others

26.3. Were there dust when it repaired ?

0. No 1. A little bit 2. Medium 3. More

26.4. At that time was the children there ?

0. No 1. Yes

26.5. When you repaired, did you remove the old paint ?

0. No (Go to no. 26.7) 1. Yes

26.6. What technique did you apply to remove old paint ?

1. Brush 2. Burn 3. Other, Specify -----

26.7. If you painted new, what type of paint did you use ?

0. No 1. With lead 2. Without lead
3. Don't know the type of paint,

APPENDIX A.1

A Model of Consent

I----- Age-----Permanent address-----

as a father / guardian, would like to provide consent to take out 2m.m. blood and measure the blood lead level. Details of my son / children is as follows;

Name----- Age----- Grade-----Gender-----

Signature-----

APPENDIX B

Specific Health Effects of Specific Pollutants

Pollutants	Source	Health Effects
NO ₂	One of the nitrogen oxides emitted in vehicle exhaust.	May exacerbate asthma and possibly increase susceptibility to infections.
SO ₂	Mostly produced by burning coal Some SO ₂ is emitted by diesel vehicles.	May provoke wheezing and exacerbate asthma. It is also associated with chronic bronchitis.
Particulates PM 10, Total Suspended Particulates, Black Smoke.	Includes a wide range of solid and liquid particles in air. Those less than 10 µm in diameter (PM 10) penetrate the lung fairly efficiently and are most hazardous to health. Diesel vehicles produce proportionately more particulates than petrol vehicles.	Associated with a wide range of respiratory symptoms. Long term exposure is associated with an increased risk of death from heart and lung disease. Particulates can carry carcinogenic materials into the lungs.
Acid Aerosols	Airborne acid formed from common pollutants including sulphur and nitrogen oxides.	May exacerbate asthma and increase susceptibility to respiratory infections. May reduce lung function in those with asthma.
Carbon Monoxide (CO)	Comes mainly from petrol car exhaust.	Lethal at high doses. At low doses can impair concentration and neurobehavioural function. Increases the likelihood of exercise related heart pain in people with coronary heart disease. May present a risk to the fetus.
Ozone (O ₃)	Secondary pollutant produced from nitrogen oxides and volatile compounds in the air.	Irritates the eyes and air passages. Increases the sensitivity of the airways to allergic triggers in people with asthma. May increase susceptibility to infection.
Lead (Pb)	compound present in leaded petrol to help the engine run smoothly.	Impairs the normal intellectual development and learning ability of children.

Volatile Organic compounds (VOCs)	A group of chemicals emitted from the evaporation of solvents and distribution of petrol fuel. Also present in vehicle exhaust.	Benzene has given most cause for concern in this group of chemicals. It is a cancer causing agent which can cause leukaemia at higher doses than are present in the normal environment.
Polycyclic Aromatic Hydrocarbons (PAHs)	Produced by incomplete combustion of fuel. PAHs become attached to particulates.	Includes a complex range of chemicals, some of which are carcinogens. It is likely that exposure to PAHs in traffic exhaust poses a low cancer risk to the general population.
Asbestos	May be present in brake pads and clutch linings, specially in heavy duty vehicles. Asbestos fibres and dust are released into the atmosphere when vehicles brake.	Asbestos can cause lung cancer and mesothelioma, cancer of the lung lining. The consequences of the low levels of exposure from braking vehicles are not known.

Source: Headley, A.J., and Lam, T. H.,(1994). Respiratory disease. Ashden Trust.

APPENDIX C

Schedule of Activities

S.N.	Activities	Date	Remarks
1.	Develop questionnaire and instruments	21 - 24 Nov.	
2.	Selection of focus group members	25 - 30 Nov.	
3.	Prior notice to the focus group members	25 Nov.	
4.	Structured questionnaire survey	25 - 30 Nov.	
5.	Focus group discussion	30 Nov.	
6.	Field observation	30 Nov.	
7.	Report preparation, analysis and Interpretation,	1 - 10 Nov.	
8.	Report writing,	10 - 15 Dec.	
9.	Submit report	Dec 21.	

GANTT Chart of Activities

S.N.	Activities	November	December
		21----25-----30	1---5---10---15----21
1.	Develop questionnaire and instruments	=====	
2.	Selection of focus group members	==	
3.	Prior notice to the focus group members	==	
4.	Structured questionnaire survey	=====	
5.	Focus group discussion	==	
6.	Field observation	==	
7.	Report preparation, analysis and Interpretation,		=====
8.	Report writing,		=====
9.	Submit report		==

APPENDIX D

**World Health Organization Ambient Air Quality Guidelines
(1977-1979)**

Pollutant	Unit	Averaging Time	Concentrations	Statistics
SO ₂ Plus	µg/m ³	Annual	40-60	Annual mean ^ψ
British smoke	µg/m ³	Annual	40-60	Annual mean
SO ₂ Plus	µg/m ³	24 hour	100-150	Maximum ^ψ
British Smoke	µg/m ³	24 hour	100-150	Maximum
Carbon monoxide	Ambient limits to be derived from 2.5 - 3% maximum carboxyhemoglobin in blood (air concentrations will vary)			
Ozone	µg/m ³	1 hour	120	Maximum ^φ
Nitrogen Dioxide	µg/m ³	1 hour	190-320	Maximum ^φ
Total Suspended	µg/m ³	24 hour	150-230	Maximum
Particulate	µg/m ³	Annual	60-90	Annual mean

^ψ Maximum value should not be exceeded more than 7 days per year.

^φ Maximum value should not be exceeded more than once per month.

Source: Lipfert,(1994)

APPENDIX E

Details of Data Collection

Res. No.	Age	No. of Family	Occupation	Education	Monthly Income	Monthly Expense	Transport	Communication	1	2	3	4
1	35	5	B	Sec.	50,000	10,000	P.bus	Pub.Tel.	M.V.	Y	C	N
2	25	2	B	Sec.	8,000	8,000	MC	Pub. Tel	M.V.	Y	C	N
3	25	1	S	Pri.	4,000	2,000	P.bus	Pvt.Tel	M.V.	Y	C	N
4	30	3	S	High.	15,000	5,000	P.bus	Pub.Tel	M.V.	Y	C	N
5	31	3	S	Pri.	5,000	4,000	P.bus	Pub. Tel	O.P.	Y	C	N
6	32	3	B	High	6,000	5,000	P.bus	Pub. Tel	M.V.	Y	C	N
7	32	4	B	Pri.	8,000	4,500	P. bus	Pub.Tel	M.V.	Y	C	N
8	34	4	S	High	3,500	3,500	P.bus	Pub. Tel	M.V.	Y	C	N
9	34	5	B	Sec.	50,000	35,000	P. bus	Pub. Tel	M.V.	Y	P.W	N
10	25	2	S	Sec.	12,000	5,000	P.bus	Pvt.tel	M.V.	Y	C	N
11	21	1	S	Pri	7,000	3,500	P.bus	Pvt tel	M.V.	Y	C	N
12	23	1	S	Pri	4,000	2,000	P.bus	Pvt. Tel	M.V.	Y	C	N
13	22	2	B	Pri	6,000	4,500	P.bus	Pvt. Tel	M.V.	Y	P.W.	N
14	26	4	S	Pri	8,000	6,700	P.bus	Pvt.Tel	O.P.	Y	O.M.	N
15	23	3	S	Pri	12,000	9,300	P.bus	Pvt.Tel	M.V.	Y	O.M	N
16	32	5	B	Sec	40,000	18,000	P.bus	Pvt.Tel	M.V.	Y	C	N
17	21	1	S	Pri	9,000	3,000	P. bus	Pvt.Tel	M.V.	Y	C	N
18	30	6	B	Sec	25,000	18,000	MC	Pvt.tel	M.V.	Y	C	N
19	28	2	B	Pri	6,000	4,5000	MC	Pvt tel	M.V.	Y	C	N

Contd.....

Res. No.	Age	No. of family	Occupation	Education	Monthly income	Monthly Expense	Transport	Communication	1	2	3	4
20	32	5	B	Pri	15,000	11,000	P.bus	Pvt. Tel	M.V.	Y	P.W.	N
21	30	3	S	Sec	10,000	8,000	P. bus	Pub. Tel	O.P.	Y	O.M	N
22	28	1	S	High	22,000	5,000	MC	Pvt tel	M.V.	Y	O.M	N
23	26	2	S	High	8,000	5,000	P.bus	Pvt tel	M.V.	Y	C	N
24	32	5	B	Pri	45,000	25,000	P.bus	Pvt tel	M.V.	Y	C	N
25	20	3	B	Sec	22,000	11,000	P.bus	Pvt. Tel	M.V.	Y	C	N
26	34	4	B	High	60,000	30,000	P.bus	Pvt. Tel	M.V.	Y	P.W	N
27	35	3	B	Sec	10,000	4,000	P.bus	Pub Tel	M.V	Y	O.M	N
28	35	6	S	Sec	15,000	7,000	P.bus	Pvt.tel	M.V.	Y	C	N
29	26	3	B	Pri	6,000	5,000	P.bus	Pvt.Tel	O.P.	Y	C	N
30	29	4	B	Pri	12,000	8,000	P.bus	Pvt.Tel	M.V.	Y	C	N
Total	-	-	B = 16; S = 14.	Pri = 14; Sec= 10; High= 6.	503,500.	398,000	MC=3 P.Bus=27	Pub=10; Pvt=20	MV=26; OP = 4	Y=30	C= 22 PW= 3 OM=5	N =30
Mean	28.53	3.2	-	-	16,783.	13,267.	-	-	-	-	-	-

M.V. = Motor vehicle; O.P = Over population; Y = yes; N = No; C = children; P.W. = Pregnant Woman; O.M. = Old men;

1 = What do you think about the cause of air pollution ?

2 = Do you know it is harmful to health ?

3 = Who is more vulnerable ?

4 = Do you know the idea of prevention from lead poisoning ?

APPENDIX F

Number of Vehicles Registered in Bagmati Zone and in Country (Nepal)

Year	Bagmati Zone		Nepal	
	Yearly Registered	Total	Yearly Registered	Total
1983/84	-	-	2,524	
1984/85	-	-	2,629	
1985/86	-	-	2,103	
1986/87	-	-	1,879	
1987/88	-	-	2,374	
1988/89	-	-	3,245	
1989/90	-	-	4,471	
1990/91	-	-	16,088	
1991/92	-	64,925		118,866
1992/93	7,934	72,859		-
1993/94	8,306	81,165		130,955
1994/95	7,409	88,574		-
1995/96	12,686	101,260		162,749*
1996/97	8,306	109,566		-

Source - 1. Statistical Pocket Book, 1988;1992;1996;
 2. Department of Transport Management/HMG, Nepal.

*Data taken till 1996 feb/march.

APPENDIX G

Number of Vehicles Registered in Bagmati Zone Till July,1996.

Type of Vehicles	Tourist	Government	Corporation	Private	Commercial	CD/UN	Total
1. Bus	157	74	46	264	836	-	1,377
2. Minibus	96	63	18	383	1,021	-	1,581
3. Truck, Tanker, Crane	46	707	284	1,274	2,467	-	4,778
4. Tractor,	-	47	18	448	1,161	-	1,674
5. Car, Jeep, Van	252	4,551	1,372	19,240	3,603	-	28,998
6. Tempo	-	144	35	255	3,498	-	3,932
7. Motorcycle, scooter	-	3,074	1,226	59,187	-	-	64,487
8. CD/UN	-	-	-	-	-	2,739	2,739
Total	551	8,660	2,999	82,031	12,586	2,739	109,566

Source-Bagmati Zonal Transport Management Office/HMG, Nepal.

APPENDIX H

Number of Vehicles Registered in Bagmati Zone Till July,1995.

Types of Vehicles	Tourist	Government	Corporation	Private	Commercial	CD/UN	Total
1. Bus	130	72	35	249	756	-	1,242
2. Minibus	96	55	18	377	1,003	-	1,549
3. Truck, Tanker, Crane,	46	681	275	1,171	2,315	-	4,488
4. Tractor	-	47	18	448	1,161	-	1,674
5. Car, Jeep, Van	215	4,409	1,307	17,801	3,374	-	27,106
6. Tempo	-	138	35	254	3,425	-	3,852
7. Motorcycle, Scooter	-	2,960	1,208	53,771	-	-	57,939
8. CD/UN	-	-	-	-	-	3410	3,410
Total	487	8,362	2,896	74,071	12,034	3410	101,260

Source-Bagmati Zonal Transport Management Office/HMG, Nepal

APPENDIX I

Number of Vehicle Registered in Bagmati Zone Till July,1994

Type of Vehicle	Tourist	Government	Corporation	Private	Commercial	CD/UN	Total
1. Bus	36	69	34	238	668	-	1,045
2. Minibus	19	54	16	364	975	-	1,428
3. Truck/Tanker	10	635	246	1,084	2,089	-	4,064
4. Dozer/Crane	-	-	-	1	-	-	1
5. Car/Jeep	26	4,217	1,121	16,645	2,237	-	24,246
6. Tempo	-	138	35	254	3,417	-	3,844
7. Motorcycle	-	2,780	1,093	45,392	-	-	49,265
8. Tractor	-	47	18	448	1,161	-	1,674
9. Other	-	-	-	-	-	3,007	3,007
10. Total	91	7,940	2,563	64,426	10,547	3,007	88,574

Source- Bagmati Zonal Transport Management Office/ HMG, Nepal.

APPENDIX J

Vehicle Registration in Bagmati Zone During the Fiscal Year 1993/94

Type of Vehicle	Tourist	Government	Private	Corporation	Commercial	Total
1. Bus	17	35	14	-	100	166
2. Minibus	6	1	11	2	16	36
3. Truck/Tanker	5	14	65	37	280	401
4. Dozer/Crane	-	-	-	-	-	-
5. Car/Jeep	4	164	1,496	95	25	1,884
6. Tempo	-	-	-	-	-	-
7. Motorcycle	-	179	5,442	77	-	5,698
8. Tractor	-	1	10	-	-	11
9. Rickshaw	-	-	-	-	-	-
10. Total	32	494	7,038	211	421	8,306

Source- Bagmati Zonal Transport Management Office/HMG, Nepal.

APPENDIX K

Vehicle Registration in Bagmati Zone During the Fiscal Year 1992/93.

Types of Vehicle	Tourists	Government	Corporation	Private	Commercial	CD/UN	Total
1. Bus	5	2	1	5	61	-	74
2. Minibus	3	8	2	12	50	-	75
3. Truck/Tanker	2	11	9	107	264	-	393
4. Dozer/Crane	-	-	-	-	-	-	-
5. Car/Jeep	22	161	70	1,238	13	-	1,504
6. Tempo	-	-	-	-	-	-	-
7. Motorcycle	-	197	98	5,239	-	-	5,534
8. Tractor	-	1	-	7	-	-	8
9. Rickshaw	-	-	-	-	-	-	-
10. Others	-	-	-	-	-	346	346
Total	32	380	180	6,608	388	346	7,934

Source- Bagmati Zonal Transport Management Office, Department of Transport Management/HMG, Nepal.

APPENDIX L

Number of Vehicles Registered in the Country Till July 1991.

Type of Vehicles	Government	Corporation	Private	Commercial	CD/UN	Total
1. Bus	39	67	261	2,993	-	3,360
2. Minibus	59	31	430	1,318	-	1,838
3. Truck/ Tanker	1,122	513	1,803	6,557	-	9,995
4. Dozer/ Crane	68	-	57	9	-	129
5. Car/Jeep	4,911	1,125	16,371	3,761	-	26,168
6. Tempo	141	37	314	3,930	-	4,422
7. Motorcycle	3,394	1,553	40,908	1	-	45,856
8. Tractor	316	183	5,031	1,972	-	7,502
9. Rickshaw/Thela	1	2	436	16,942	-	17,381
10. Others	-	-	-	-	2,215	2,215
Total	10,046	3,511	66,611	37,483	2,215	118,866

Source-Department of Transport Management/HMG,Nepal.

APPENDIX M

Number of Vehicles Registered in the Country Till July 1993,

S.N.	Types of Vehicles	Tourists	Government	Corporation	Private	Commercial	CD/UN	Total
1.	Bus	40	115	69	294	4,616	-	5,134
2.	Minibus	11	68	38	476	1,507	-	2,100
3.	Truck/Tanker	8	1,182	603	2,141	9,292	-	13,226
4.	Dozer/Crane	-	63	6	95	11	-	175
5.	Car/Jeep	29	5,404	1,327	20,521	4,202	-	31,483
6.	Tempo	-	141	37	445	4,015	-	4,638
7.	Motorcycle	-	3,860	1,823	56,397	27	-	62,117
8.	Tractor	-	329	193	6,277	2,361	-	9,160
9.	Others	-	-	-	-	-	2,922	2,922
10.	Total	88	11,162	4,106	86,646	26,031	2,922	130,955

Source- Statistical Year Book of Nepal, 1995 CBS/NPC/HMG. Nepal. (Page-436)

APPENDIX N

Vehicle Registration in Various Zones of Nepal. (Till July, 1992)

S.N	Zone	Bus	Minibus	TruckTanker	Car/Jeep	Tempo	Motorcycle	Tractor	Rickshaw	Others	Total
1.	Mechi	135	31	248	249	6	602	147	1,410	1	2,829
2.	Koshi	177	97	694	1,315	116	2,823	546	4,232	59	10,059
3.	Sagarmatha	71	8	181	263	4	795	199	688	3	2,212
4.	Janakpur	151	12	290	300	1	1,180	622	1,091	51	3,698
5.	Narayani	1,565	171	4,766	2,578	409	4,585	2,077	1,194	9	17,354
6.	Bagmati	792	1,352	3,343	20,748	3,844	37,774	1,623	822	2,561	72,859
7.	Gandaki	175	159	386	1428	-	1,576	292	19	8	4,043
8.	Lumbini	599	159	838	880	78	2,487	1,379	5,779	17	12,216
9.	Rapti	65	-	55	84	2	235	182	3	-	626
10.	Bheri	89	25	333	385	11	991	288	1,588	14	3,724
11.	Seti	52	5	232	114	10	200	305	612	2	1,532
12.	Mahakali	95	4	120	90	3	216	104	322	-	954
13.	Dhawalagiri	-	-	-	-	-	-	-	-	-	-
14.	Karnali	-	-	-	-	-	-	-	-	-	-
15.	Total	3,966	2,023	11,486	28,434	4,484	53,464	7,764	17,760	2,725	132,106

Source- Department of Transport Management/HMG, Nepal.

APPENDIX O

Number of Vehicles by Type Registered Till Feb. 1996,

S.N.	Types of Vehicles	Tourists	Government	Corporation	Private	Commercial	CD/UN	Total
1.	Bus	85	120	71	322	5,717	12	6,325
2.	Minibus	27	68	39	498	1,605	-	2,237
3.	Truck/Tanker	16	1,250	652	2,425	11,300	12	15,655
4.	Dozer/Crane	-	64	6	16	11	-	177
5.	Car/Jeep	58	5,779	1,466	24,534	5,453	161	37,456
6.	Tempo	-	154	37	588	4,178	-	4,957
7.	Motorcycle	1	4,233	2,022	73,978	110	23	80,367
8.	Tractors	-	333	194	8,938	2,825	1	12,291
9.	Others	-	2	3	21	-	3258	3,284
10.	Total	187	12,003	4,490	111,405	31,197	3467	162,749

Source- Statistical Pocket Book, 1996, CBS/NPC/HMG, Nepal.

APPENDIX P

Maximum and Minimum Mean Temperature (monthly basis)
of Kathmandu Valley by Year.

Elevation - 1336m.
In Centigrade.

S.N.	Year	Maximum	Minimum
1.	1984	28.3	0.1
2.	1986	28.9	2.7
3.	1988	28.9	3.0
4.	1990	29.2	3.2
5.	1992	30.0	2.0
6.	1994	30.0	3.0

Source- Statistical Year Book Of Nepal, 1995; CBS/NPC/HMG, Nepal.

APPENDIX Q**Motor Vehicle Emission Test Till Mid- June,1997 by Valley Traffic Office, Kathmandu.**

Vehicle Type	Tourist	Government	Corporation	Private	Commercial	CD/UN	Total
Passed/ Green Card	535	1384	555	12167	9619	1294	25554
Failed/ Red Card	264	793	353	6319	8247	422	16398
Total	799	2177	908	18486	17866	1716	41952

Source- INTERNET,23 July 1997
The Rising Nepal (English Newspaper)
Kathmandu, Nepal.

APPENDIX R

**Rising Trends of Road Length in Various Fiscal Year in the country,
In Kilometer.**

Year	Black Topped	Gravelled	Earthern	Total
1983/84	-	-	-	5,717
1984/85	-	-	-	5,925
1985/86	-	-	-	6,039
1986/87	2,794	1,180	2,332	6,306
1987/88	-	-	-	6,611
1988/89	-	-	-	7,007
1989/90	2,958	1,658	2,714	7,330
1990/91	3,083	2,181	3,064	8,328
1991/92	-	-	-	-
1992/93	3,404	2,373	3,757	9,534
1993/94	-	-	-	-
1994/95	3,533	2,662	4,529	10,724

Source- 1. Statistical Pocket Book, 1988, 1990, 1994 and 1996. CBS/NPC/HMG, Nepal.
2. Department of Road/ HMG, Nepal.

APPENDIX S

Length of Road in Bagmati Zone by Type and Year.

In Kilometer.

Road Type	Highway				Feeder Road				District Road				City Road				Grand Total
	Year	B.T	G.	E.	Total	B.T.	G.	E.	Total	B.T.	G.	E.	Total	B.T.	G.	E.	
1984	202	-	27	229	232	81	39	352	27	57	33	117	169	124	118	411	1,109
1985	202	27	-	229	260	53	47	360	28	57	70	155	179	121	112	412	1,156
1986	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1987	202	-	27	229	180	51	47	278	28	68	107	203	188	112	112	412	1,122
1988	202	27	-	229	108	131	23	262	126	131	95	352	185	89	38	312	1,155
1989	202	27	-	229	146	150	61	357	93	124	142	359	199	102	48	349	1,294
1990	204	27	-	231	134	144	39	317	107	142	168	417	200	101	48	349	1,314
1991	193	26	-	219	149	140	55	344	100	152	304	556	206	94	65	365	1,484
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	199	26	-	225	190	103	26	319	69	208	417	694	231	95	65	391	1,629
1994	196	26	-	222	194	105	33	332	73	209	507	789	255	95	44	394	1,737

Source- 1. Statistical Year book of Nepal, 1995, CBS/NPC/HMG Nepal.

2. Department of Road/ HMG, Nepal. B.T = Black Topped; G = Gravel; E = Earthen.

Note- Kathmandu, Lalitpur and Bhaktapur are the cities of Bagmati zone. Hence cities roads lies within the valley.

APPENDIX T

The Increasing Trend of the Ratio of Road Lengths and Number of Vehicles in Kathmandu Valley.

Year	Lengths of Road in Valley (km.)	Lengths of Road in Bagmati Zone	Number of Vehicles	Road /Vehicle Ratio in Valley	Road /Vehicle Ratio in Bagmati Zone
1990	-	1,314	-	-	-
1991	-	1,484	64,925	-	1:43.75
1992	-	-	72,859	-	1:49.00
1993	-	1,629	81,159	-	1:49.82
1994	941	1,629	88,574	1:94.13	1:54.37
1995	943	1,737	101,260	1:107.38	1:58.30
1996	943	1,737	109,566	1:116.19	1:63.07

On an average 9000 vehicles are added each year in the road of Bagmati zone.

On an average Per kilometer /year 11 vehicles are increased in the city road of Kathmandu valley.

Source- Tables - 2.1, 2.2 and 2.10.

APPENDIX U

Fuel Imported in Nepal by Type and Year,

S.N.	Item	Unit	1991/92	1992/93	1993/94	1994/95
1.	Coal	M. Ton	101350.1	58485.76	54753.97	50074.53
2.	Petrol	Kilolitre.	26790	29784	31476	35019
3.	Diesel	„	166552	179765	195474	228016
4.	Kerosene	„	122464	149205	162324	176963
5.	L.D.O.	„	2532	1530	1530	3794
6.	F.O.	„	11274	20222	27319	32003
7.	A.T.F.	„	25036	29277	30438	37886

Note:

L.D.O. - Light Dieseld Oil,

F.O. - Furnace Oil,

A.T.F. - Aviation Turbine Fuel,

Source - Statistical Pocket Book, 1996,CBS/NPC/HMG Nepa

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