

FULBRIGHT LECTURE SERIES

Air Quality Where You Are: *The Paradox of a Livable City*

Thursday, May 3, 2018
3:00-5:00 p.m.

Hotel Tibet
Lazimpat, Kathmandu
Nepal



Air quality related policies, laws and standards

Govinda Prasad Lamichhane
Environment Inspector
Department of Environment

Constitution of Nepal

- ▶ Fundamental right

Article 30 Right to clean environment:

(1) Every citizen shall have the right to live in a clean and healthy environment.

(2) The victim shall have the right to obtain compensation, in accordance with law, for any injury caused from environmental pollution or degradation

Environment protection Act 2053 and Environment protection regulation 2054

➤ Salient features of the act

- ❑ Provision of Environment Impact Assessment (EIA) and initial environmental examination (IEE)

- ❑ Pollution control

Provision of compensation

Penalty

Environment inspector

सूचना २

नेपाल सरकारले वातावरण संरक्षण नियमावली, २०५४ को नियम १५ ले दिएको अधिकार प्रयोग गरी देहाय बमोजिमको वायुको गुणस्तर सम्बन्धी राष्ट्रिय मापदण्ड, २०६९ (National Ambient Air Quality Standard, 2012) तोकेको छ।

Standards

- ▶ National Ambient air quality standard

Parameters	Units	Averaging time	Concentration max	Test Methods
TSP	$\mu\text{g}/\text{m}^3$	Annual	-	
		24-hours*	230	High Volume Sampling and Gravimetric Analysis
PM ₁₀	$\mu\text{g}/\text{m}^3$	Annual	-	
		24-hours*	120	High Volume Sampler and Gravimetric Analysis, TOEM, Beta Attenuation
Sulfur Dioxide	$\mu\text{g}/\text{m}^3$	Annual**	50	Ultraviolet Fluorescence, West and Gaeke Method
		24-hours*	70	Same as annual
Nitrogen Dioxide	$\mu\text{g}/\text{m}^3$	Annual	40	Chemiluminescence
		24-hours*	80	Same as annual
Carbon Monoxide	$\mu\text{g}/\text{m}^3$	8 hours*	10,000	Non Dispersive Infra Red spectrophotometer (NDIR)
Lead	$\mu\text{g}/\text{m}^3$	Annual**	0.5	High Volume Sampling, followed by atomic absorption spectrometry
Benzene	$\mu\text{g}/\text{m}^3$	Annual**	5	Gas Chromatographic Technique
PM _{2.5}	$\mu\text{g}/\text{m}^3$	24-hours*	40	PM _{2.5} sampling gravimetric analysis
Ozone	$\mu\text{g}/\text{m}^3$	8-hours*	157	UV spectrophotometer

- ▶ Till now 12 air quality monitoring stations.
 - ▶ Measure TSP, PM10, PM2.5 and PM1
- www.pollution.gov.np

Government of Nepal
Ministry of Population and Environment
Department of Environment
Air Quality Monitoring

'जब सुधिन्छ मान्छे आफैँ भित्र
तब मात्र बन्छ वातावरण पवित्र'

HomePage
AQ Network Overview
▼ Stations

- Pulchowk, Lalitpur
- Lumbini, Rupendehi
- Tribhuvan University, KTM
- Dhulikhel, Kavre
- Sauraha, Chitwan
- Gandaki Boarding School, PKR
- DHM Pokhara
- Ratnapark, Kathmandu

Station Name	PM2.5 (Real Time)
Pulchowk, Lalitpur	22.1 $\mu\text{g}/\text{m}^3$
Lumbini, Rupendehi	20 $\mu\text{g}/\text{m}^3$
Tribhuvan University, KTM	-
Dhulikhel, Kavre	28.4 $\mu\text{g}/\text{m}^3$
Sauraha, Chitwan	17.2 $\mu\text{g}/\text{m}^3$
Gandaki Boarding School, PKR	-
DHM Pokhara	-
Ratnapark, Kathmandu	-
Shankha Park, KTM	-
Bhaisipati, KTM	20.8 $\mu\text{g}/\text{m}^3$
Pokhara University, PKR	-
Birendra School, KTM	38.8 $\mu\text{g}/\text{m}^3$

Air Quality



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Sauraha, Chitwan

Shankha Park, KTM

Tribhuvan University,

Pulchowk, Lalitpur

Name	Pulchowk, Lalitpur
Code	PULCHOWK_KTM
Status	Running
Latitude	27.682581
Longitude	85.318841
Altitude	
Site Contact Person Name & Number	
SIM1 Number	
SIM2 Number	

	Current	1 Hour (Running Avg)	Past 8 Hours (Running Avg)	Past 24 Hours (Running Avg)	Yesterday 24 Hours	Annual
Total Suspended Particulate	33.5 µg/m³	27.13 µg/m³	42.735 µg/m³	114.208 µg/m³	39.416 µg/m³	-
PM1	18.6 µg/m³	19.257 µg/m³	16.799 µg/m³	15.702 µg/m³	15.767 µg/m³	-
PM2.5	20.5 µg/m³	21.684 µg/m³	20.468 µg/m³	20.789 µg/m³	19.024 µg/m³	-
PM10	25.6 µg/m³	25.836 µg/m³	28.029 µg/m³	44.343 µg/m³	25.703 µg/m³	-

- ▶ In Kathmandu From November to May most of the day, level of pollution exceed national standard.
- ▶ In terms of PM 2.5 lumbini is more polluted than Kathmandu
- ▶ Even in Sauraha level of PM 2.5 pollution is much higher.

- ▶ Standard on Emission and stack Height for Brick industry (published on Nepal gazette on 2074/10/08)

ईटा उद्योगबाट निस्कने धुवाँ तथा चिम्नीको उचाई सम्बन्धी मापदण्ड
(Standard on Emission and Stack Height for Brick Industry)

S.N.	Types of Kiln	Suspended Particular Matter (Maximum limit) (mg/Nm ³)	Height of Stack (Minimum limit) (meter)
1	Bull's Trench Kiln, Forced Draft (Fixed Chimney)	350	17
2	Bull's Trench Kiln, Natural Draft (Fixed Chimney)	500	30
3	Hoffmann Kiln, Forced Draft	350	17
4	Hoffman Kiln, Natural Draft	500	30
5	Vertical Shaft Brick Kiln (VSBK)	250	15
6	Hybrid Hoffmann Kiln (HHK)	200	7
7	Tunnel Kiln	100	10

- ▶ Nepal Vehicle Mass Emission standard, 2069
- ▶ Vehicle Emission Standards for Green stickers

Vehicle Emission Standards for Green Stickers

Since October 23, 2000 (2057/07/07)

Petrol operated vehicles

S.No.	Types of vehicles	CO% by volume	HC (ppm)
1	Four Wheelers 1980 or older	4.5	1000
2	Four Wheelers 1981 onwards	3	1000
3	Two-wheelers (two-stroke)	4.5	7800
4	Two-wheelers (four-stroke)	4.5	7800
5	Three-wheelers	4.5	7800

Gas Operated vehicles

S.No.	Types of vehicles	CO% by volume	HC (ppm)
1	Four- wheelers vehicles	3	1000
2	Three wheelers vehicles	3	7800

Diesel Operated Vehicles

S.No.	Types of vehicles	HSU
1	Older than 1994 A.D	75
2	1995 A.D onwards	65

नेपाल सरकार

निर्माण तथा यातायात मन्त्रालय

यातायात व्यवस्था विभागको

सवारी आवागमनमा निषेध बारेको सूचना

नेपाल सरकारको निर्णय अनुसार सवारी साधनहरूबाट निस्कने धुँवा प्रदुषण नियन्त्रण गर्नका लागि २०५३ जेष्ठ २३ गते देखि उपत्यका ट्राफिक प्रहरी कार्यालयबाट सवारी साधनको धुँवा प्रदुषण जाँच कार्य हुँदै आइरहेकोमा तोकिएको मापदण्ड भित्र नपरेका रातो स्टिकर पाएका वा सवारी नै जाँच नगराएका २ पाङ्गे बाहेकका सबै सवारी साधनहरूलाई २०५५ साल आषाढ १ गते देखि थप निम्न स्थानहरूमा सवारी आवागमनमा निषेध गरिएको हुँदा सर्वसाधारणको जानकारीको लागि यो सूचना प्रकाशित गरिएको छ ।

धुँवा प्रदुषण जाँच गराउने प्रयोजनको लागि मात्र रातो स्टिकर पाएका तथा प्रदुषण जाँच गराउन जाने सवारी साधनलाई भद्रकाली सिंहदरवार हुँदै ट्राफिक प्रहरी कार्यालय सम्म मात्र प्रवेश गर्न रोक नलगाइएको व्यहोरा समेत जानकारी गराइन्छ ।

०५३ साल कार्तिक १५ गते देखि सवारी आवागमनमा निषेध गरिएका स्थानहरू :

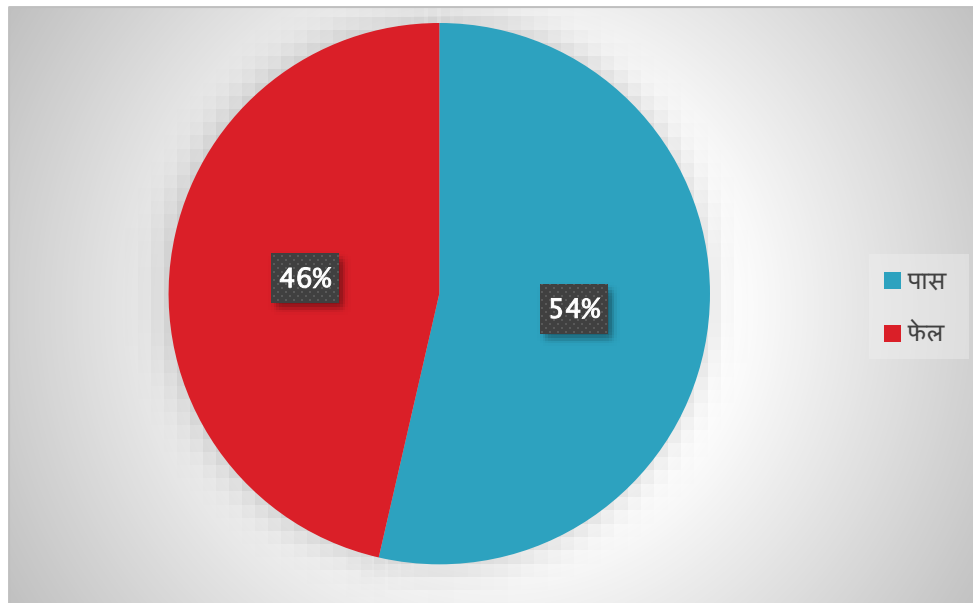
१. सिंहदरवार श्री ५ पृथ्वीनारायण शाहको सालिक देखि पुतली सडक चोक हुँदै कमलादी चोक (इन्द्र बुड हाउस) सम्म ।
२. एयरपोर्ट चोक (रिङ्गरोड बाट एयरपोर्ट जाने स्थान) देखि एयरपोर्ट क्षेत्र भित्र सम्म ।

०५५ साल आषाढ १ गते देखि सवारी आवागमनमा थप निषेध गरिने स्थानहरू :

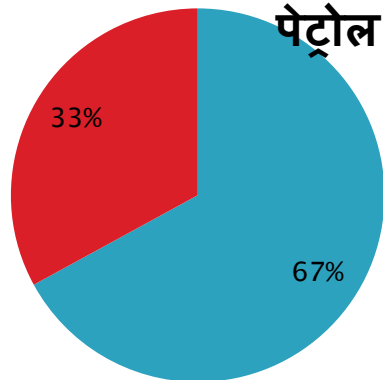
१. दरवार मार्गको स्व. श्री ५ महेन्द्रको शालिक देखि राजदरवारको दक्षिण मुल ढोका सम्म ।
२. नयाँ सडकको ढोका देखि जुद्ध शम्शेरको सालिक सम्म ।
३. त्रिदेवी मार्ग ।
४. इन्द्रचोक देखि ठाँटी हुँदै ठमेलसम्म ।
५. काठमाडौं महानगरपालिका, ललितपुर उप-नगरपालिका तथा भक्तपुर नगरपालिकाका दरवार स्क्वायर क्षेत्रहरू ।

Compliance of green sticker standards in Kathmandu

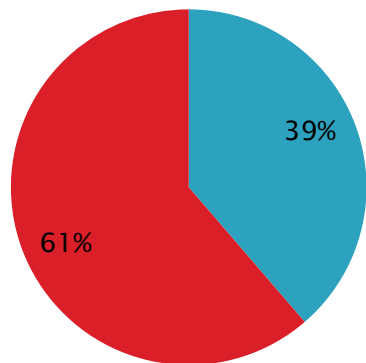
- ▶ Since November
- ▶ Total inspected 970

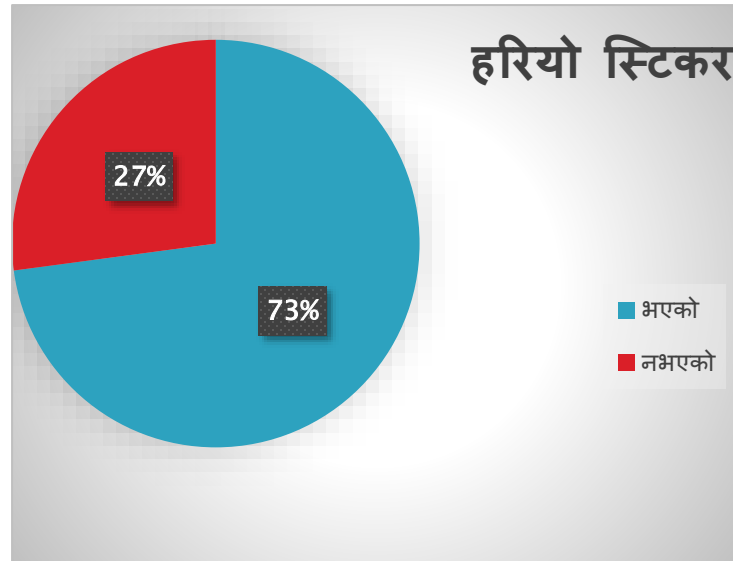


पेट्रोल गाडी



डिजेल गाडी





- ▶ 41% of the vehicles having green stickers do not comply to the standard.

Other standards

- ▶ Standard on dust emission from cement and crusher industries
- ▶ Emission standard for imported new diesel generators
- ▶ Emission standards for in used Diesel generators
- ▶ Standard on Emission for Industrial Boiler
- ▶ Standard on Chimney Height for Industrial Boiler
- ▶ National Indoor Air Quality standard, 2009

Not commenced yet (these standards shall commence on such date as the ministry may by a notification published in the Nepal Gazette appoint)

Strategies and Action Plan

- ▶ National pollution control strategy and Action plan (not approved yet)
- ▶ Air pollution management action plan for Kathmandu valley (not approved yet)

THANK YOU