5th Regional Stakeholders cum Regional Coordination Meeting & 10th Session of Intergovernmental Meeting

Colombo Sri Lanka 19th – 21st August, 2008

By:

Zia-Ul-Islam

Pakistan Environmental Protection Agency

Ministry of Environment

Government of Pakistan

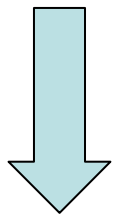
General Information

- Capital: Islamabad
- Area: 796,095 km²
- Population:
  - 164.0635 million
- Urbanization
  - 33.5%
- GDP: 5.8 % (2007-08)
- Per Capita :US$1085

Source: Population Census Organization.
Pakistan Economic Survey, 2007-08

Pak EPA

Ministry of Environment (NFP)



Pakistan Environmental Protection Agency (NIA)

Institutional Arrangements

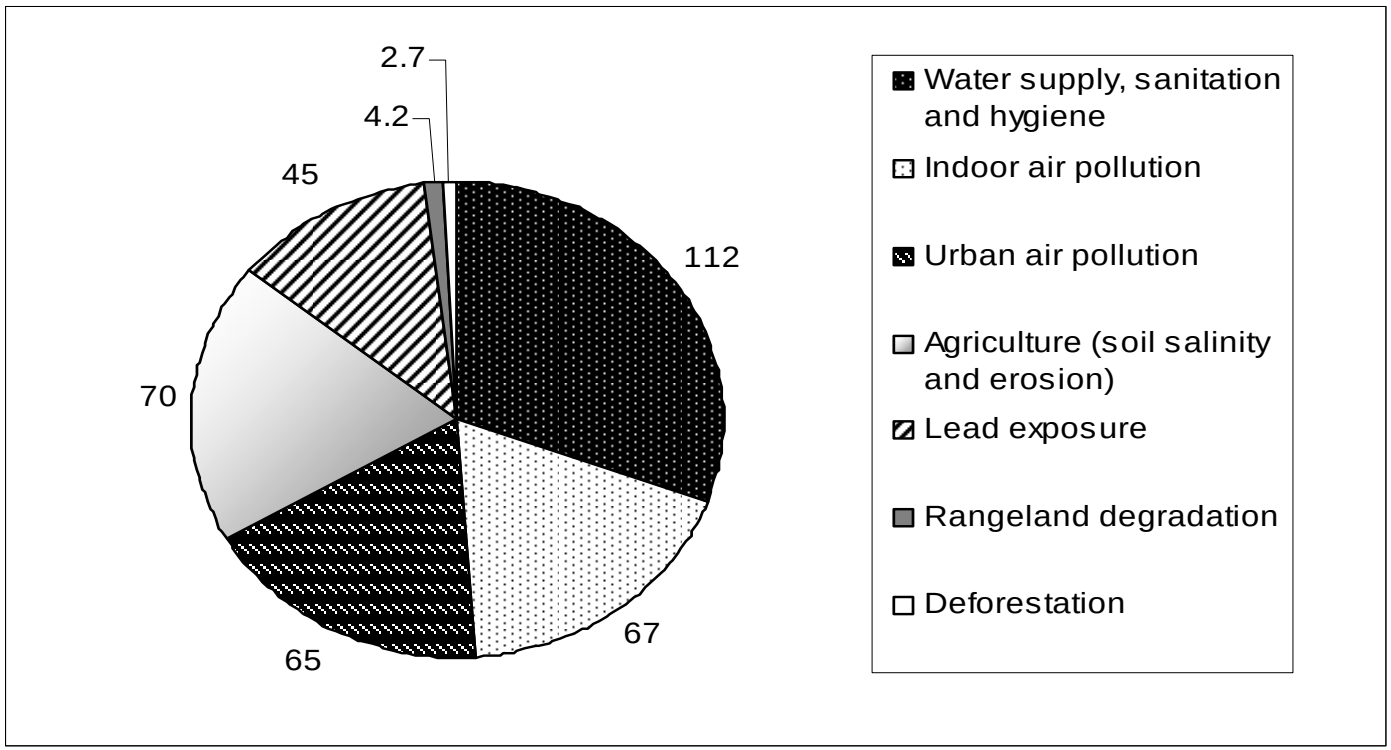
- NIA believes is strong linkages with R&D and Universities.
- We intend to strengthen this relationship by signing MOUs.

COSTS OF ENVIRONMENTAL DAMAGE

	Annual Damage in PKR
Inadequate Water Supply, Sanitation & Hygiene	**112 Billion**
Agricultural Soil Degradation	**70 Billion**
Indoor Pollution	**67 Billion**
Urban Air Pollution	**60 Billion**
Cost of Lead Exposure	**45 Billion**
Rangeland Degradation & Deforestation	**7 Billion**
Total	**249 Billion**

Source: Pakistan Strategic country Environmental Assessment Report by World Bank, 2006

Environmental Degradation - about 6% GDP: Share by Cause (Rs. bn per year)



5RSC10IG

Pak EPA

Health Impact Assessment in Pakistan

Health End-Points	Attributed Total Cases	Total Annual Costs
Premature mortality adults	21,791	58-61
Mortality children under 5 yrs	658	0.83
Chronic Bronchitis	7,825	0.06
Hospital Admissions	81,312	0.28
Emergency room visits/ outpatient hospital visits	1,595,080	0.80
Restricted activity days	81,541,893	2.06
Lower respiratory illness in children	4,924,148	0.84
Respiratory symptoms	706,808,732	0.00
Total		**62-65**

Source: Pakistan Strategic country Environmental Assessment Report by World Bank, 2006

Status of Air Quality

Generation of Pollutants by Industry

- Carbon Monoxide: 285 tons
- Nitrogen Oxides: 162 tons
- Sulphur Oxides: 378 tons
- Particulate Matter: 4,400 tons

Source: Pakistan Strategic country Environmental Assessment Report by World Bank, 2006.

Sources of Air Pollution

- Major sources are vehicles, power plants, industries and brick kilns.
- Transport-related: Old and poorly functioning vehicles, diesel trucks, two-stroke two wheelers and Rickshaws.
- High level of sulfur in diesel.
- Burning of municipal solid waste is significant, almost 57,000 tons of solid waste is generated each day, most of which is either dumped or burnt.

Air Quality Monitoring

- Air quality monitoring network recently in place.

- Fixed and mobile monitoring stations have been established to collect the data of ambient air in 5 major cities.

Monitoring Activities Under Male' Declaration

Monitoring Site: Bahawal Nagar

- Monitoring Station comprising a Laboratory was established at Bahawal Nagar in January 2007 for Trans-boundary Air Pollution Monitoring under Male′ Declaration.

Onsite Laboratory

- A laboratory for the analysis of basic parameters of the field samples collected from the dry and wet-only collectors was also established at the site.

List of Equipments Installed

- High Volume Samplers
- Bulk collector - for deposition monitoring
- Wet-only collector – for acidic gas deposition
- Diffusive samplers (for Nitrogen Dioxide, Sulfur Dioxide and Ozone) according to the monitoring protocol
- UV-Spectrophotometer
- pH Meter
- Electricity Conductivity Meter
- All equipment were installed according to the monitoring protocol under Malé Declaration

Bahawal Nagar

Industries located around monitoring station

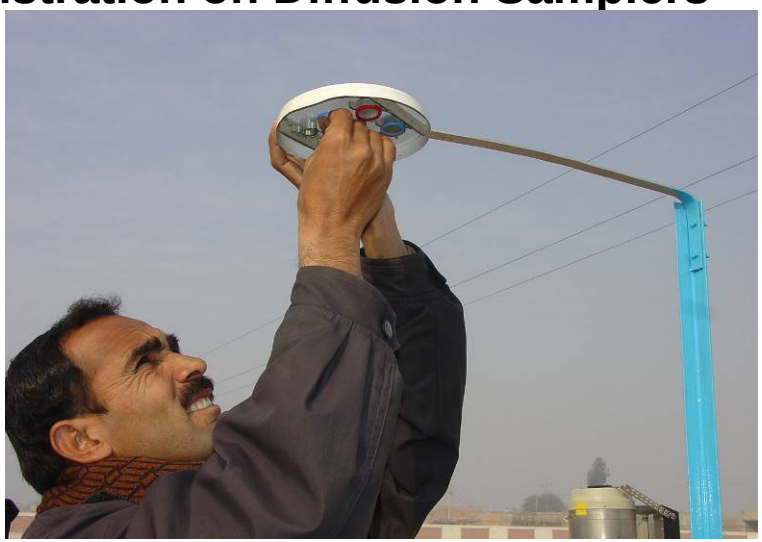
Haze / Fog phenomena in winter in Bahawalnagar

Laboratory

Pak EPA

Training on Air Sampler

Demonstration on Diffusion Samplers



Training on Bulk Collector

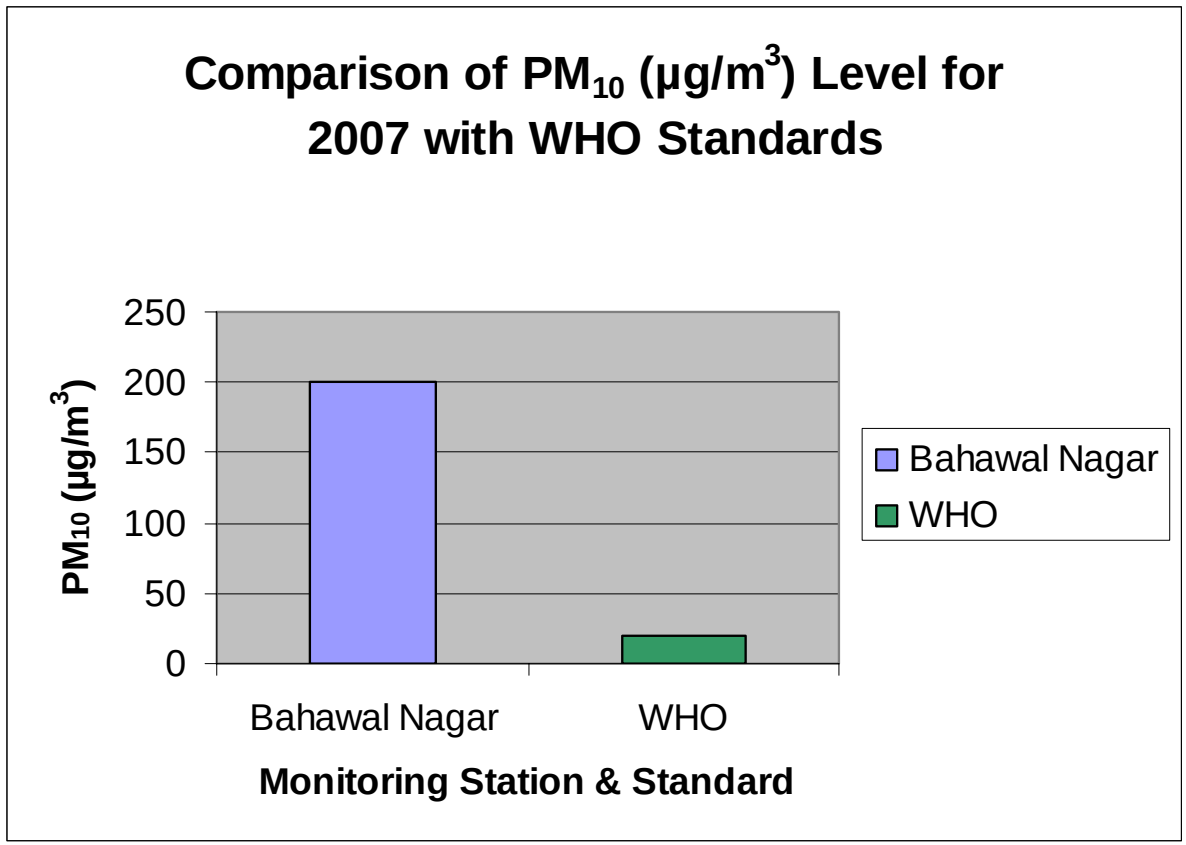
Training on Wet Only Collector

On-Site Monitoring Activities

- Samples are being collected from the Monitoring Site at Bahawal Nagar.
- PM_{10}, NRSPM & TSPM are Analyzed at the Monitoring Site.
- Samples for Analysis of SO_2 & NO_2 are being sent regularly to Swedish Environmental Research Institute, Sweden.

Monthly Average Data of HVAS from February, 2007 to December, 2007

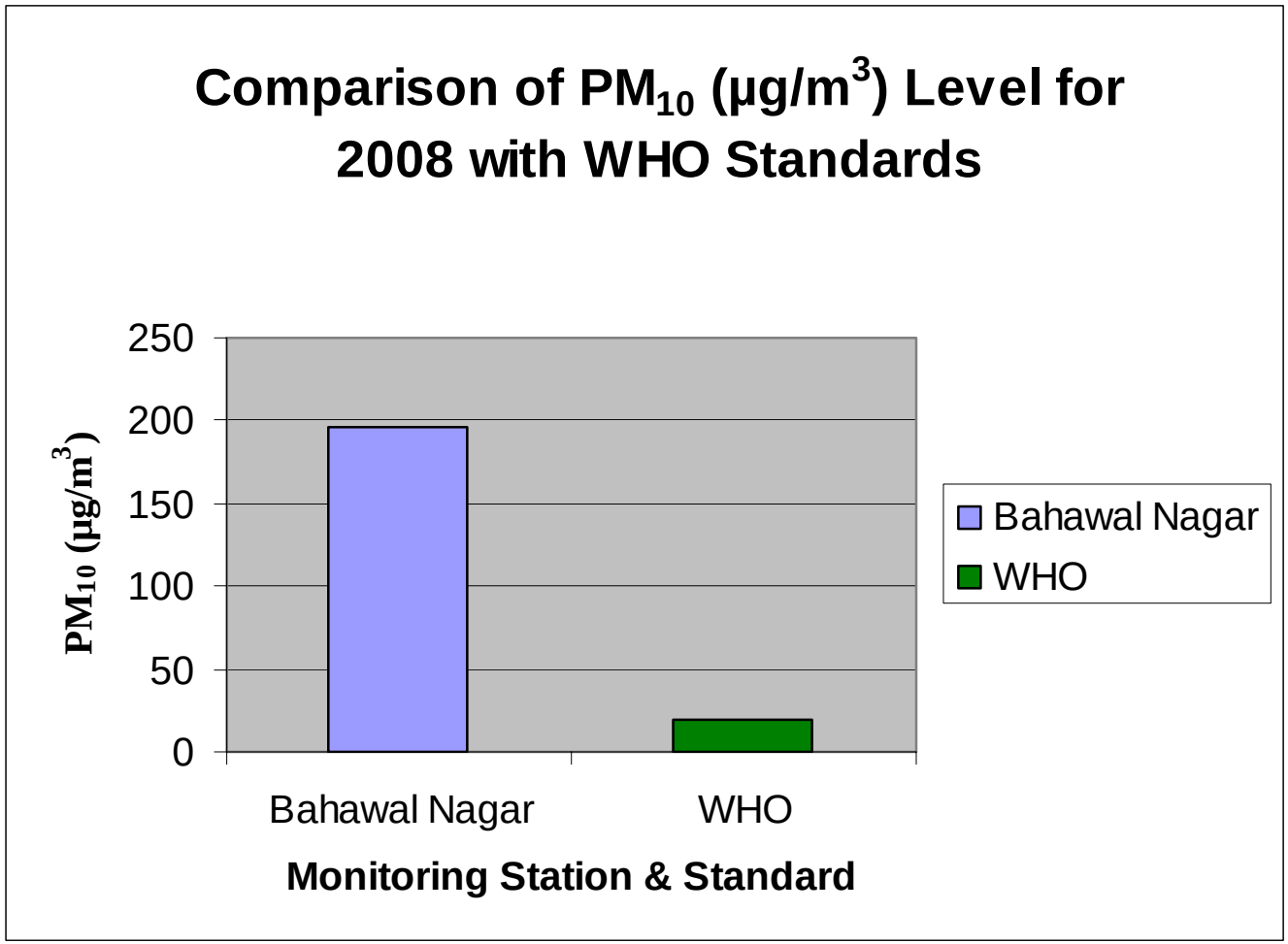
Name of month	Concentration (µg/m^3)		
	PM_{10}	**NRSPM**	**TSPM**
February, 2007	217.72	175.87	393.60
March, 2007	120.21	110.66	198.24
April, 2007	143.2	271.26	414.58
May,2007	367.52	768.63	1136.15
June , 2007	135.14	388.23	523.37
July, 2007	227.21	384.54	611.15
August, 2007	134.90	413.49	548.38
September, 2007	105.42	309.09	414.51
October, 2007	247.05	390.31	637.35
November, 2007	257.05	303.10	560.17
December, 2007	239.78	195.71	435.49
January, 2008	217.72	175.87	393.60


Comparison of PM10 (µg/m3) Level for 2007 with WHO Standards
PM10 (µg/m3)
250
200
150
100
50
0
Bahawal Nagar
WHO
Monitoring Station & Standard
Bahawal Nagar
WHO

Pak EPA

Monthly Average Data of HVAS from January, 2008 to June, 2008

Name of month	Concentration (µg/m^3)		
	PM_{10}	**NRSPM**	**TSPM**
January	169.87	165.71	335.58
February	208.78	318.44	527.21
March	173.19	294.99	468.18
April	129.98	385.30	515.27
May	349.37	872.98	1222.35
June	175.84	279.99	455.83
July	161.41	300.41	461.82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PM10 (µg/m3)
250
200
150
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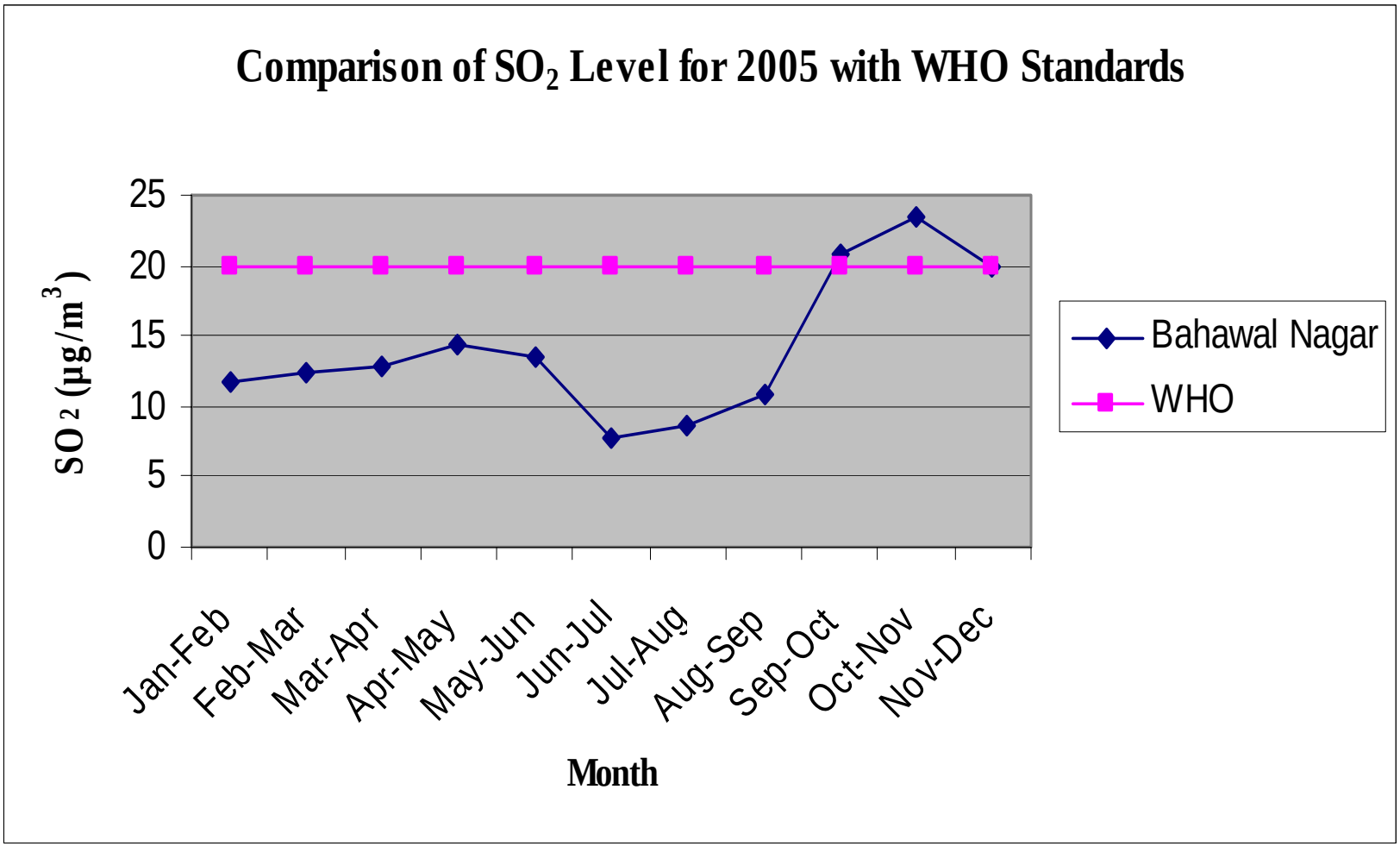
Bahawal Nagar
WHO
Monitoring Station & Standard
Bahawal Nagar
WHO

Pak EPA

Results of Diffusive Samplers for 2005

Month	**SO_2 (µ g/m^3)**	**NO_2 (µ g/m^3)**
January-February	11.7	50.6
February-March	12.4	51.5
March-April	12.9	37.5
April-May	14.4	48.3
May-June	13.4	34.3
June-July	7.8	41.1
July-August	8.7	41.8
August-September	10.9	44.7
September-October	20.9	73.5
October-November	23.5	51.0
November-December	19.9	60.2


Comparison of SO2 Level for 2005 with WHO Standards
SO2 (µg/m3)
25
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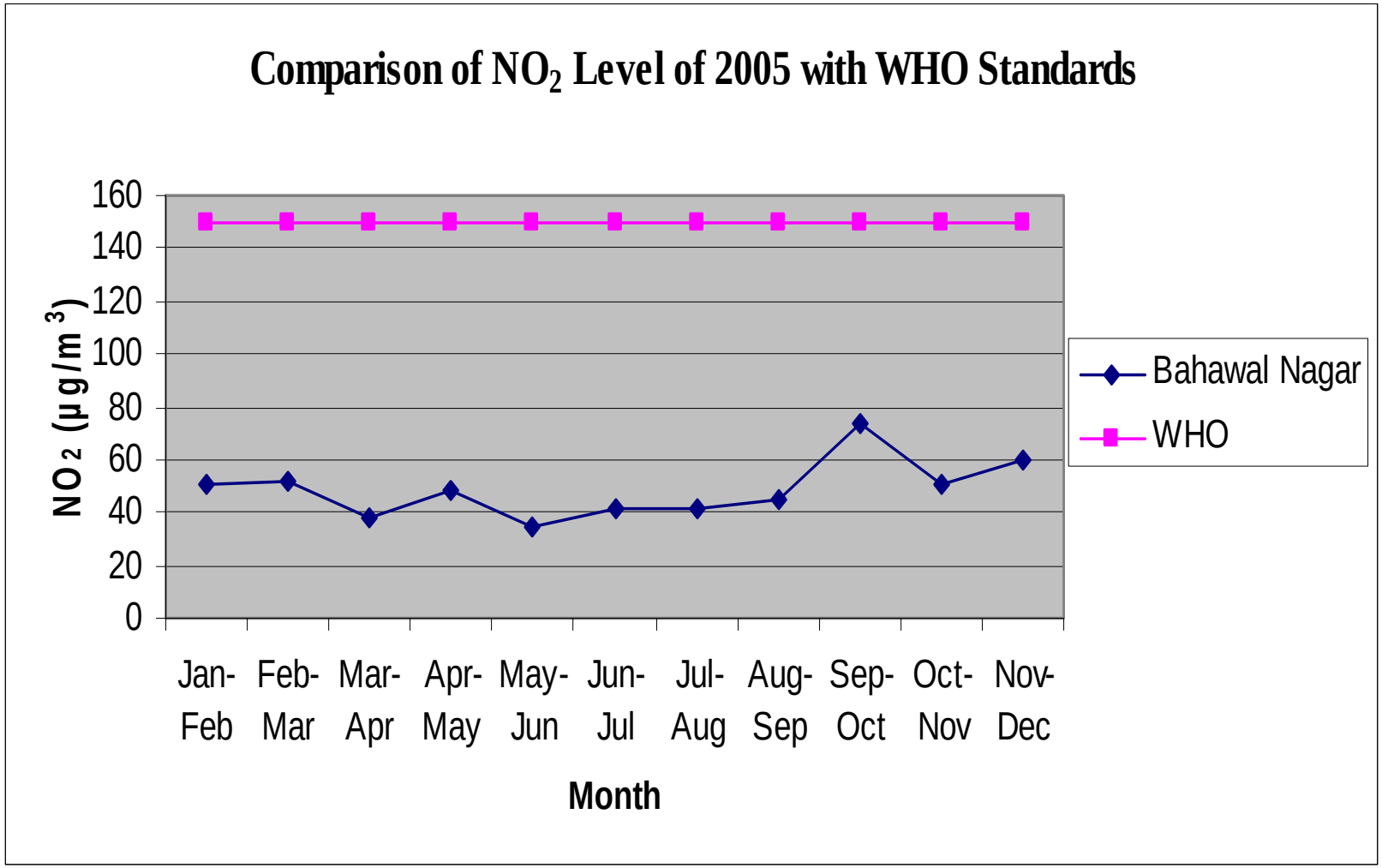
Month
Bahawal Nagar
WHO

Pak EPA


Comparison of NO2 Level of 2005 with WHO Standards
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NO2 (µg/m3)
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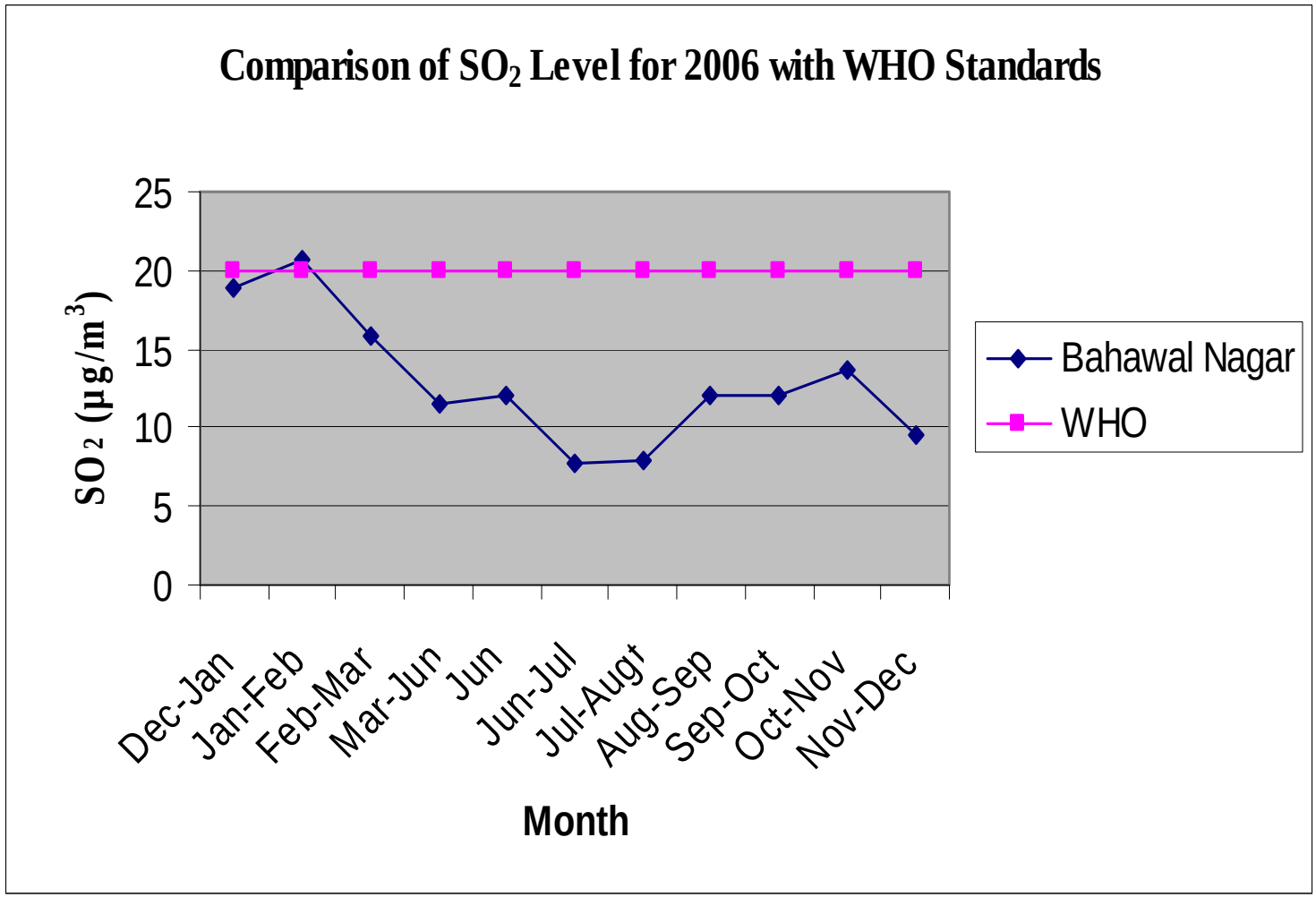
Month
Bahawal Nagar
WHO

Pak EPA

Results of Diffusive Samplers for 2006

Month	**SO_2 (µ g/m^3)**	**NO_2 (µ g/m^3)**	**O_3 (µ g/m^3)**
December-January	18.8	55.8	-
January-February	20.6	51.9	-
February-March	15.8	49.9	-
March-June	11.6	28.9	-
June	12.1	40.6	-
June-July	7.7	42.2	54.0
July-August	8.0	42.1	28.0
August-September	12.1	45.0	29.0
September-October	12.1	50.5	26.0
October-November	13.7	62.5	13.0
November-December	9.6	56.5	11.0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SO 2 (µg/m3)
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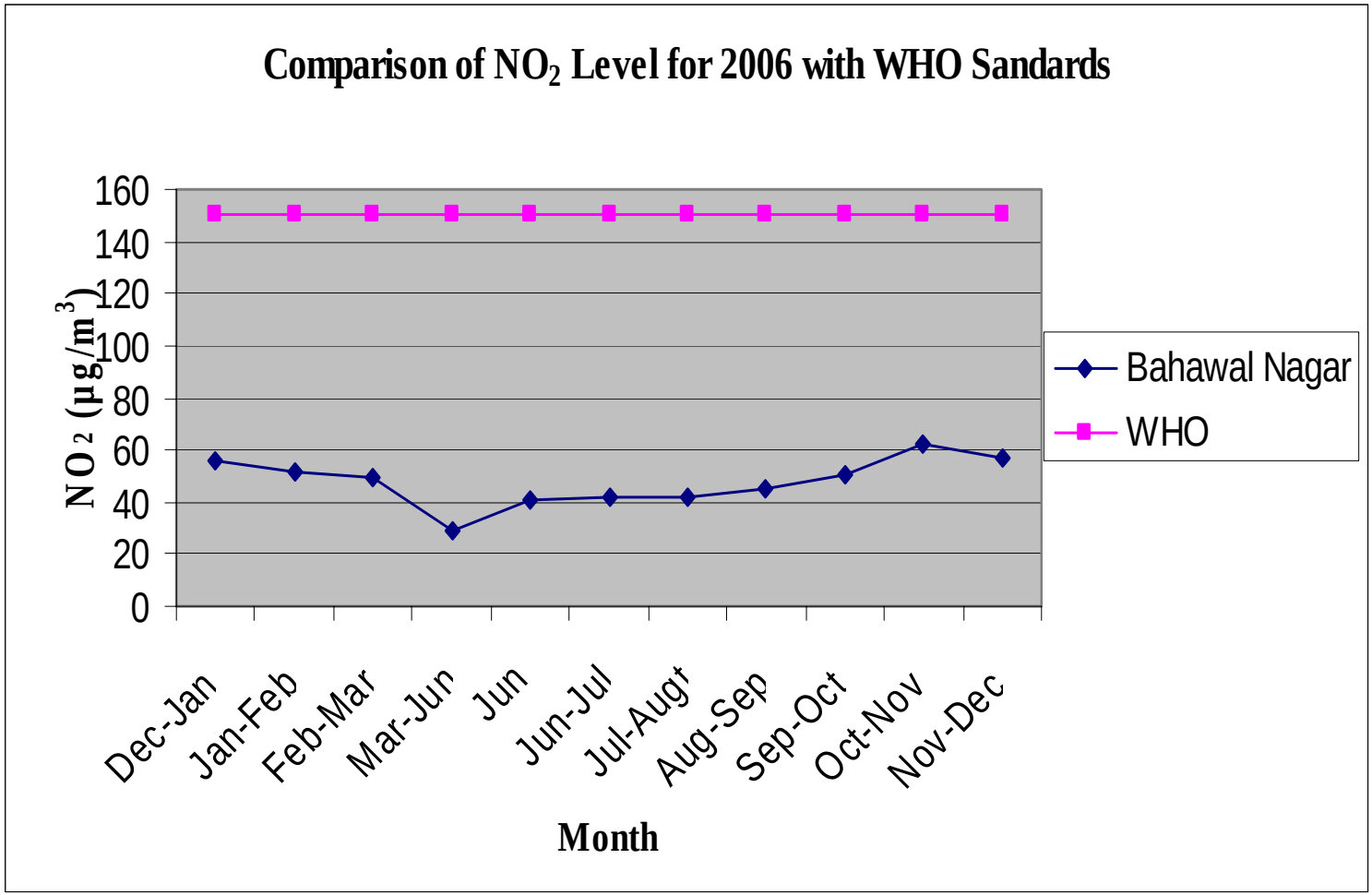
Month
Bahawal Nagar
WHO

Pak EPA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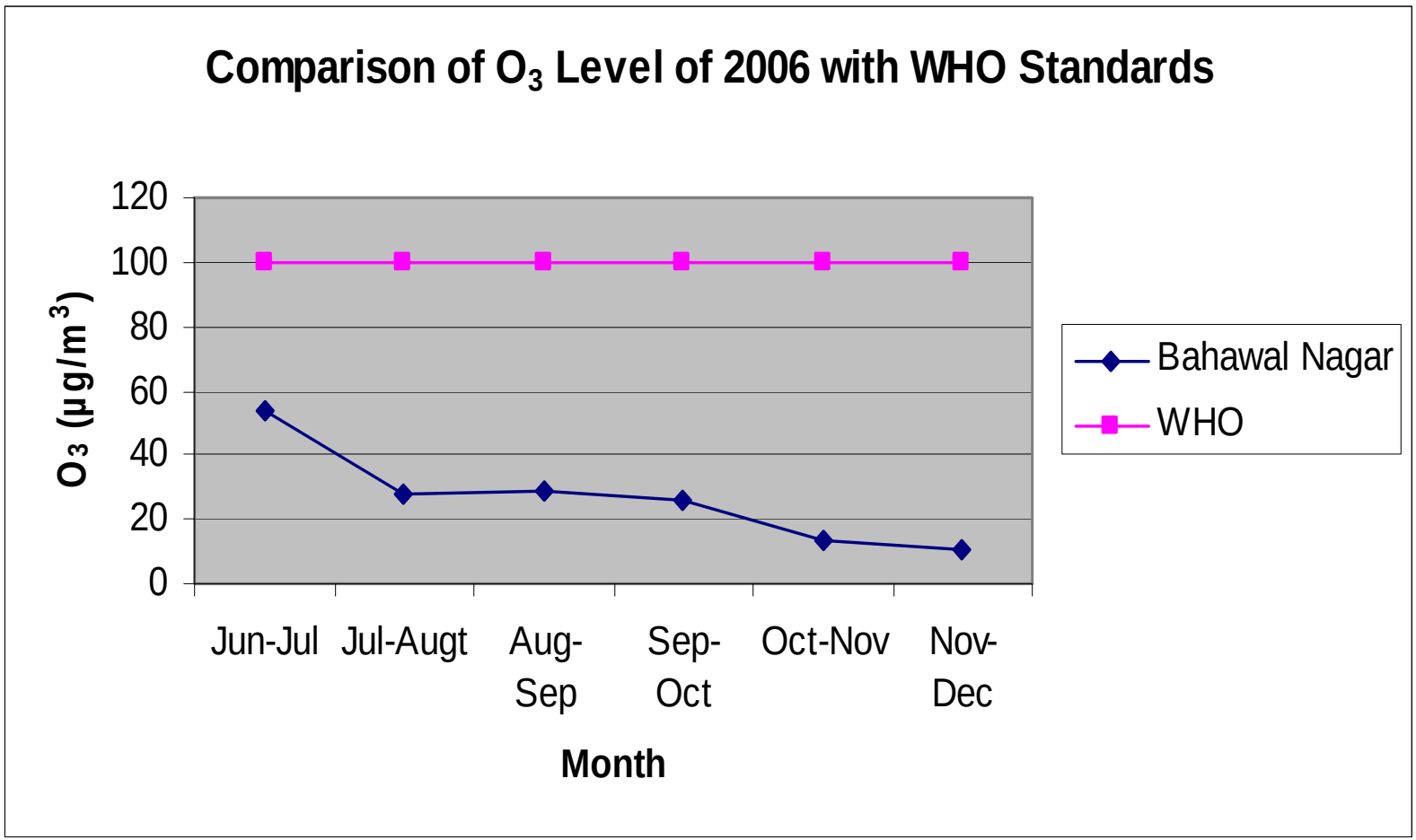
Pak EPA


Comparison of O_3 Level of 2006 with WHO Standards
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O_3 (µg/m^3)
Jun-Jul
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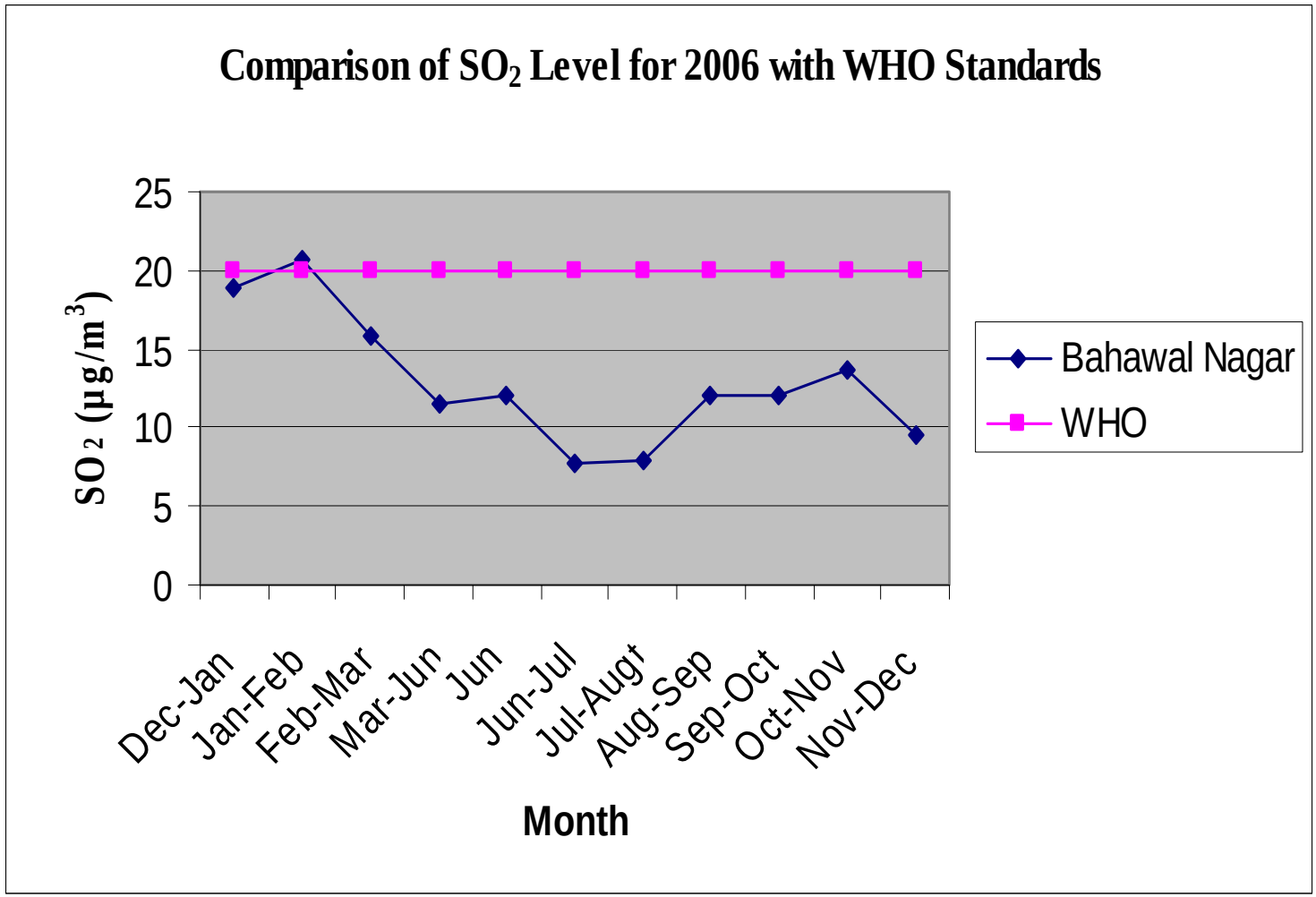
Sep-Oct
Oct-Nov
Nov-Dec
Month
Bahawal Nagar
WHO

Pak EPA

Results of Diffusive Samplers for 2007

Month	**SO_2 (µ g/m^3)**	**NO_2 (µ g/m^3)**	**O_3 (µ g/m^3)**
December-January	8.9	60.6	11.0
January-February	9.0	20.2	55.0
March-April	9.5	12.4	61.0
April	6.8	8.8	70.0
June-July	3.7	7.7	70.0
July-August	4.7	7.1	66.0
August-September	4.8	8.8	61.0
September-October	4.4	9.7	76.0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SO 2 (µg/m3)
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Month
Bahawal Nagar
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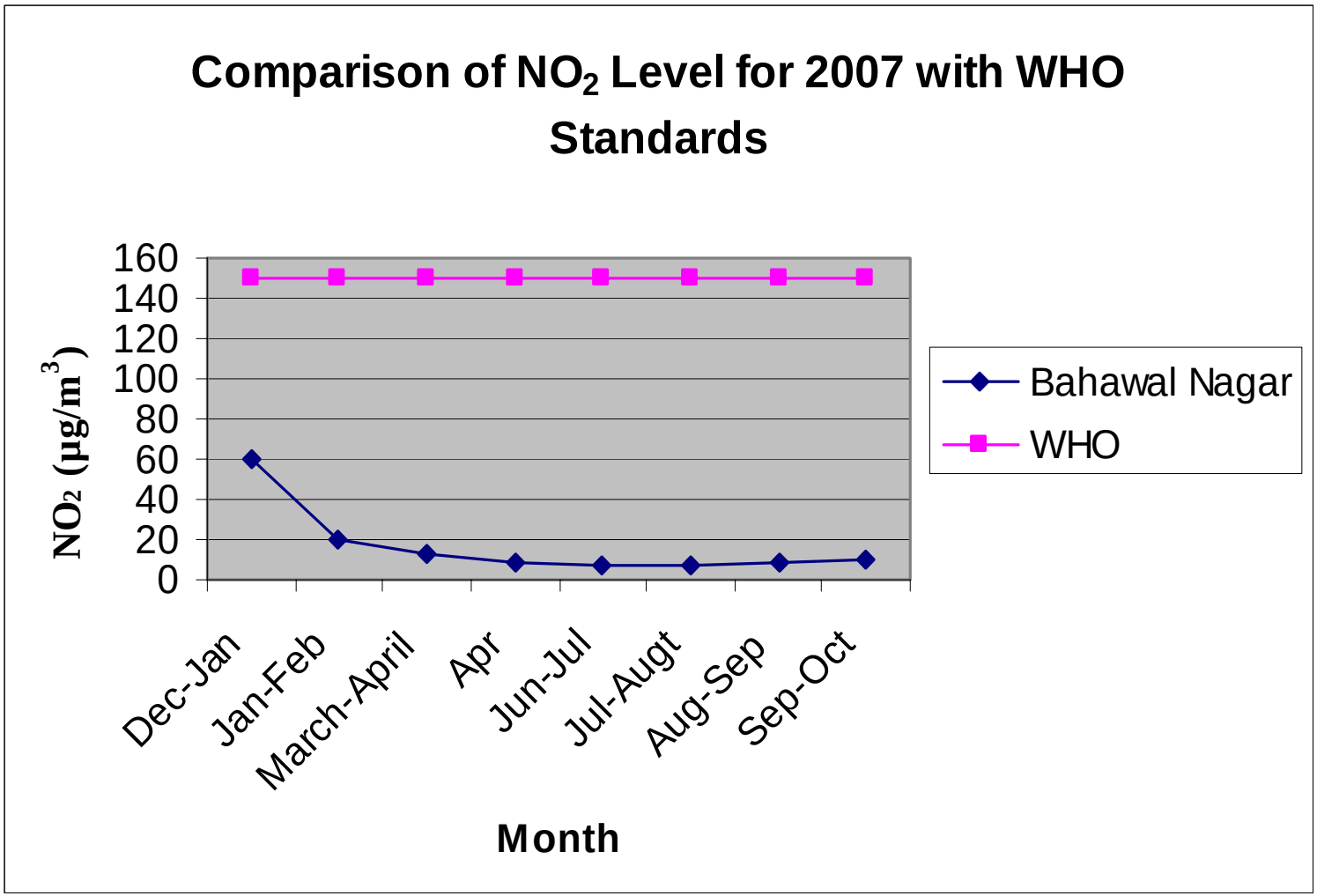
Pak EPA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Apr
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Aug-Sep
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Month
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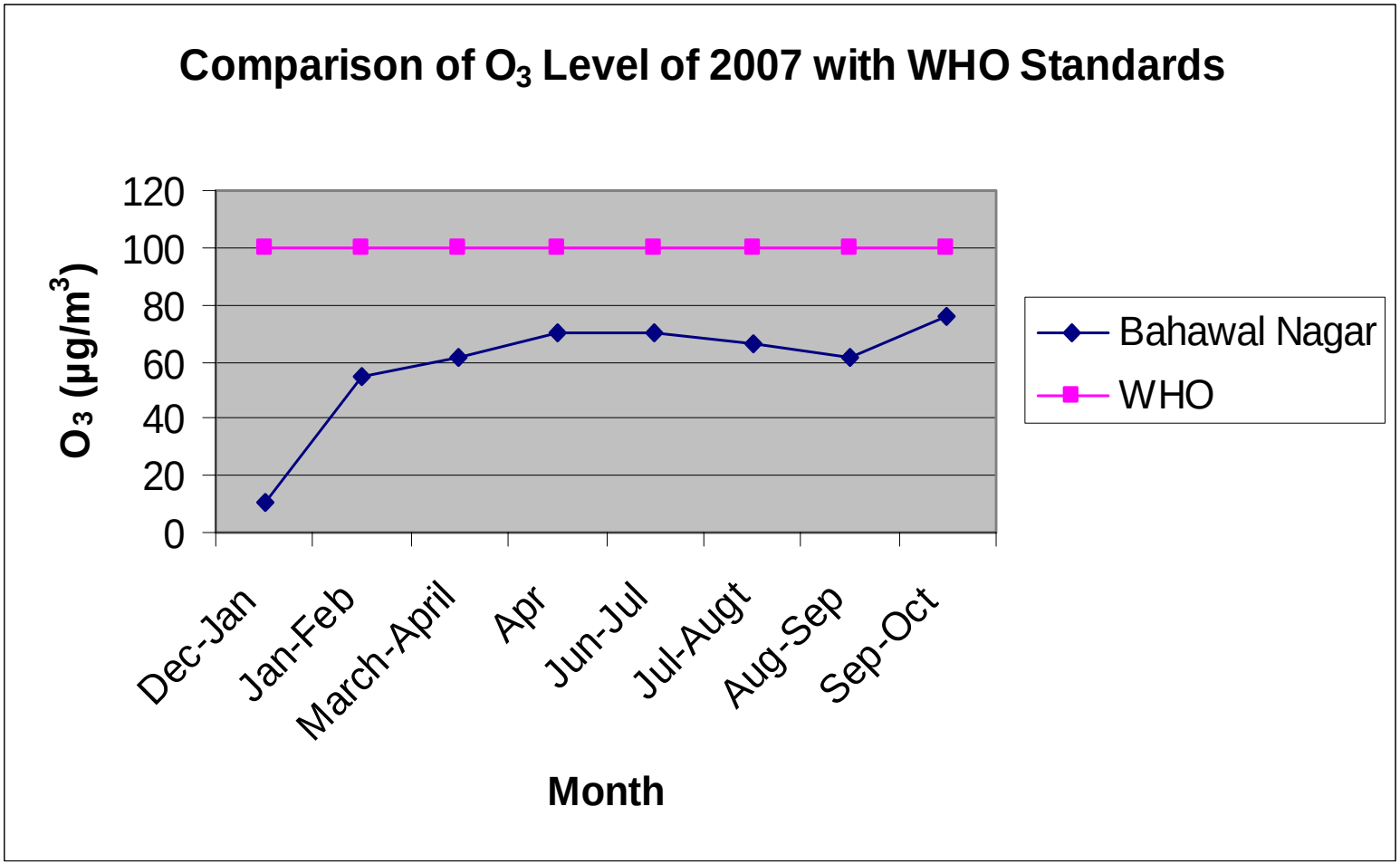
Pak EPA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80
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40
20
0
Dec-Jan
Jan-Feb
March-April
Apr
Jun-Jul
Jul-Augt
Aug-Sep
Sep-Oct
Month
Bahawal Nagar
WHO

Pak EPA

Monthly average of weekly collected data of Wet Deposition for Year 2007

(Wet only Collector)

Name of Month	Electrical Conductivity (EC) µS/cm	pH	Total Rain (mm)
February, 2007	93.5	7.4	8.48
March, 2007	-	-	-
April, 2007	222.4	7.85	1.1
May, 2007	274.4	8	trace
June, 2007	96.5	7.84	33
July, 2007	143.95	8.13	3.6
August, 2007	56	7.7	3.8
September, 2007	275	9.6	10
October, 2007	Nil	Nil	Nil
November, 2007	Nil	Nil	trace
December, 2007	210	8	1
January, 2008	238.95	7.8	4.4

Monthly average of weekly collected data of Wet Deposition for Year 2008

(Wet only Collector)

Name of Month	Electrical Conductivity (EC) µS/cm	pH	Total Rain (mm)
January	-	-	8.8
February	-	-	o
March	-	-	o
April	*	*	8.5
May	970	8.04	16
June	-	-	28.1
July			

Pak EPA

Monthly average of weekly collected data of Wet Deposition for Year 2008

(Bulk Collector)

Name of Month	Electrical Conductivity (EC) µS/cm	pH	Total Rain (mm)
January	238.95	7.79	8.8
February	-	-	0
March	-	-	0
April	393.0	7.87	8.5
May	168.05	7.99	17.5
June	136.3	8.0	28.1

Pak EPA

Inter-Comparison Study

- 8 Passive Samplers for NO_2 and SO_2 (ready for exposure) were Provided to the Malé Declaration Site.
- One Set of Four Samplers for NO_2 and SO_2 was Analyzed by the Usual Protocol Employed at Pak-EPA's Laboratory
- Send the Second Set of 4 Samplers to NUS for Analysis, along with the Protocol Employed at Pak-EPA's Laboratory.
- This Experiment was Done Twice.

Part-1 In Country Exposure and Analysis Report

NO_2 ANALYSIS REPORT

Sample ID	Exposure Time Or 14 Days	Approximate height of exposure)	Absorbance of Sample (A)	Absorbance Of Blank (A^o)	NO_2 Concentration	
					(ppb)	µg/m3
B-1	335	2.5	0.427	0.121	22.64	42.6
21	334	10	0.314	0.121	14.33	26.96
22	334	10	0.289	0.121	12.5	23.5

Rain Water Samples

- Rain Water Samples received in March, 2007 and July, 2008 have been Analyzed at NIA.

Results of Rain Water Samples for Year 2007

Parameter	Measurement/analytical method	Manufacturer/Type of equipment	Detection limits (umol/L)	Determination limit (umol/L)	Concentration (umol/L)		Note
					Sample 1	Sample 2	
pH	Glass Electrode	WTW Germany made		4-5.5 at 25. ^{o}C	5.4	5.04	
Temp*					20.20	20.20	
EC	Conductivity cell	WTW Germany made		1-10ms/m	3ms/m	5.12ms/m	
Temp*				25. ^{o}C	25.6 ^{o}C	25.6 ^{o}C	
SO_4^{2-}	Absorption Method	Anova_Spectr-oquant (MERCK)	- 0.003A to 0.002A	5 – 100	4.06	20.6	
NO_3^{-}	Absorption Method	Anova_Spectr-oquant (MERCK)	-	5 - 100	7.74	69.58	
Cl^{-}	Absorption Method	UV-1601 Schimadzu	-	5 - 150	16.64	17.21	
NH_4^{+}							**
Na^{+}							**
K^{+}							**
Ca^{2+}	Absorption Method	Anova_Spectr-oquant (MERCK	-	1 - 50	179	188	
Mg^{2+}	Absorption Method	Anova_Spectr-oquant (MERCK		1 - 50	7.81	56.2	

*- Temperature reading of the pH and EC meters (recommended value ~25^{o}C)
**- Laboratory is under commissioning and most of instruments like AAS, IC are not proper functioning.

Results of Rain Water Samples for Year 2008

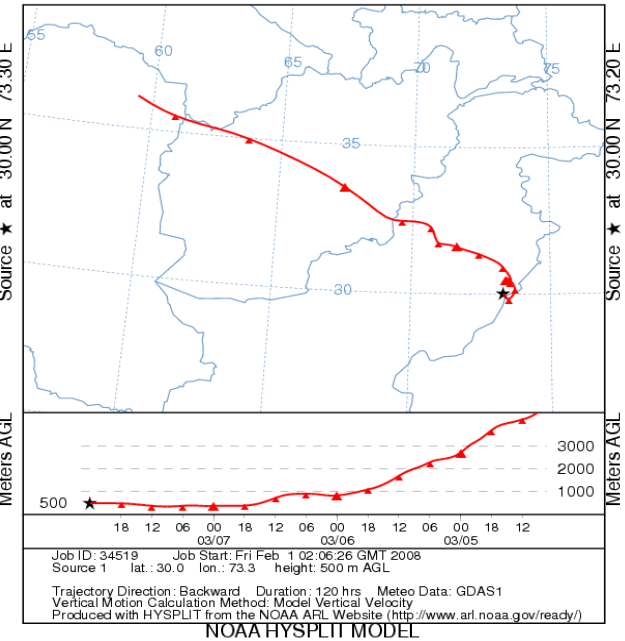
Parameter	Measurement/ analytical method	Manufacturer/Type of equipment	Detection limits (umol/L)	Determination limit (umol/L)	Concentration (umol/L)		Note
					Sample 1	Sample 2	
pH	Glass Electrode	WTW Germany made		4-5.5 at 25. ^{o}C	4.9	5.08	
Temp*					20.20	20.20	
EC	Conductivity cell	WTW Germany made		1-10ms/m	4.42µs/m	5.12µs/m	
Temp*				25. ^{o}C	27.4 ^{o}C	27.1 ^{o}C	
SO_4^{2-}	Absorption Method	Anova_Spectr-oquant (MERCK)	- 0.003A to 0.002A	5 – 100	32.9	8.3	
NO_3^-	Absorption Method	Anova_Spectr-oquant (MERCK)	-	5 - 100	18.52	9.8	
Cl^-	Absorption Method	UV-1601 Schimadzu	-	5 - 150	67.74	14.64	
NH_4^+							**
Na^+							**
K^+							**
Ca^{2+}	Absorption Method	Anova_Spectr-oquant (MERCK	-	1 - 50	120.2	39.51	
Mg^{2+}	Absorption Method	Anova_Spectr-oquant (MERCK		1 - 50	15.73	8.1	

Status of Emission Inventory

- Emission Inventory is Being Developed for Onward Submission.

Trajectories

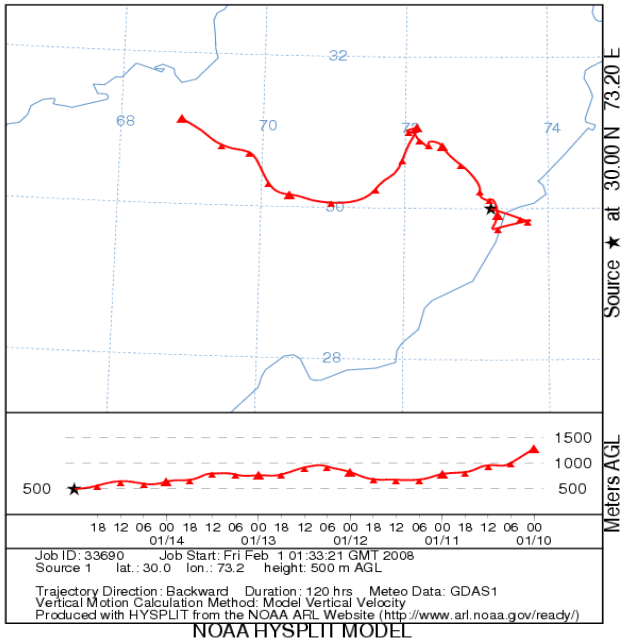
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 08 Mar 07
GDAS Meteorological Data



Job ID: 34519 Job Start: Fri Feb 1 02:06:26 GMT 2008
Source 1 lat.: 30.0 lon.: 73.3 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

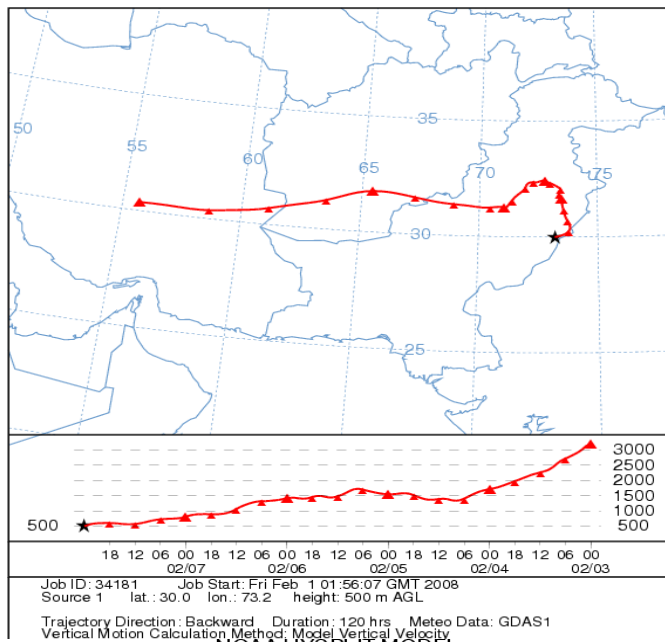
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 15 Jan 07
GDAS Meteorological Data



Job ID: 33690 Job Start: Fri Feb 1 01:33:21 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

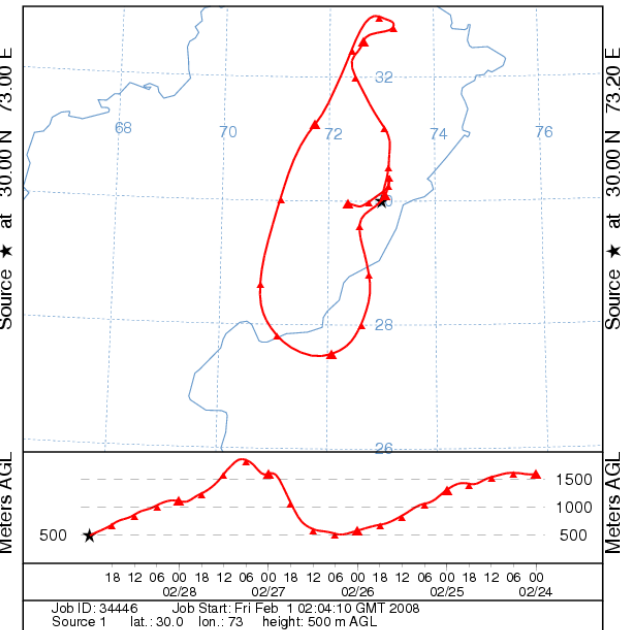
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 08 Feb 07
GDAS Meteorological Data



Job ID: 34181 Job Start: Fri Feb 1 01:56:07 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity

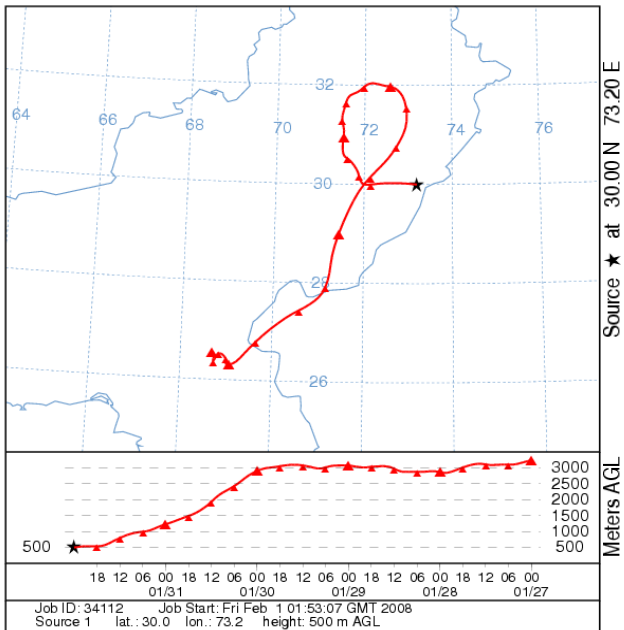
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 01 Mar 07
GDAS Meteorological Data



Job ID: 34446 Job Start: Fri Feb 1 02:04:10 GMT 2008
Source 1 lat.: 30.0 lon.: 73 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

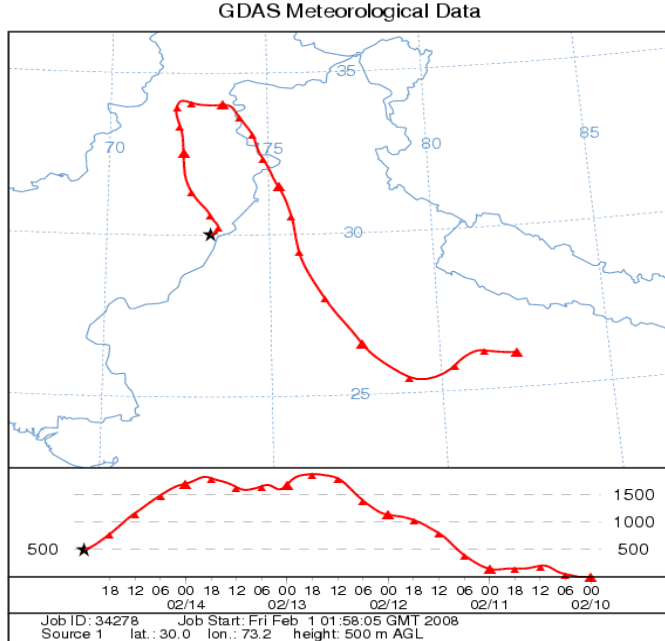
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 01 Feb 07
GDAS Meteorological Data



Job ID: 34112 Job Start: Fri Feb 1 01:53:07 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

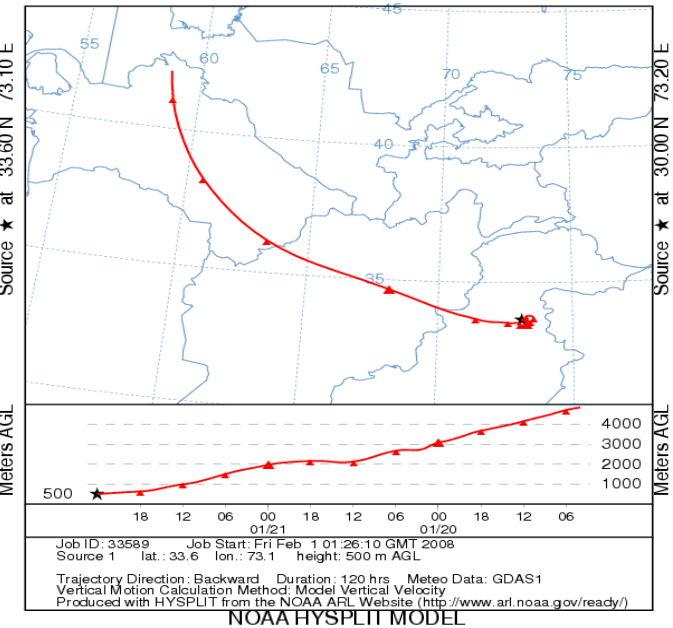
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 15 Feb 07
GDAS Meteorological Data



Job ID: 34278 Job Start: Fri Feb 1 01:58:05 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

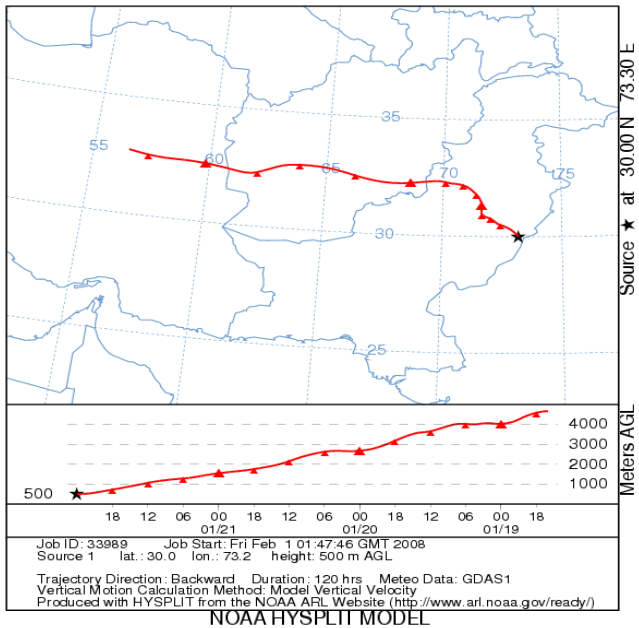
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 22 Jan 08
GDAS Meteorological Data



Job ID: 33589 Job Start: Fri Feb 1 01:26:10 GMT 2008
Source 1 lat.: 33.6 lon.: 73.1 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

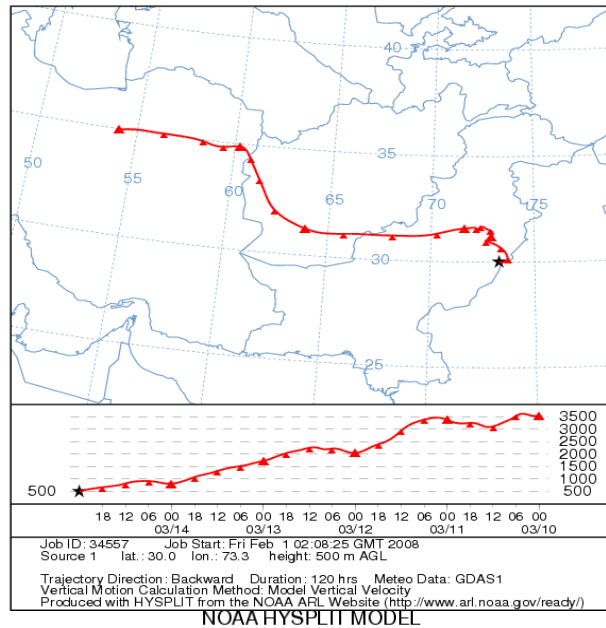
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 22 Jan 07
GDAS Meteorological Data



Job ID: 33989 Job Start: Fri Feb 1 01:47:46 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

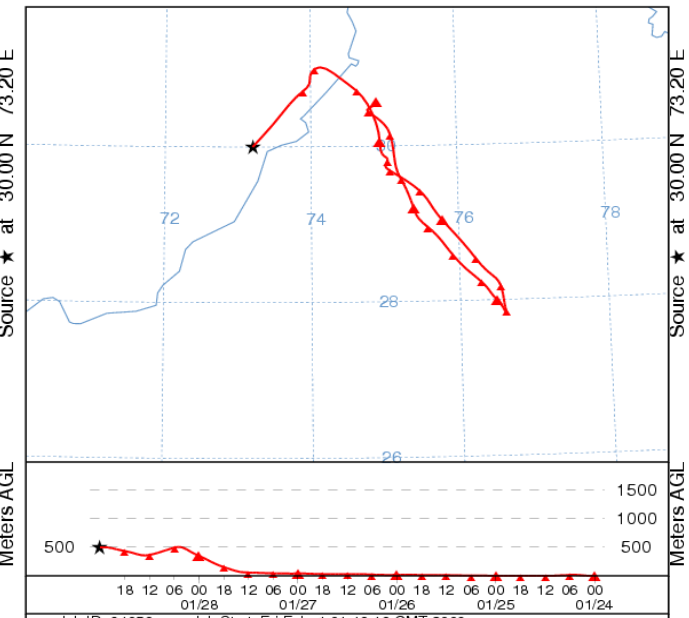
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 15 Mar 07
GDAS Meteorological Data



Job ID: 34557 Job Start: Fri Feb 1 02:08:25 GMT 2008
Source 1 lat.: 30.0 lon.: 73.3 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

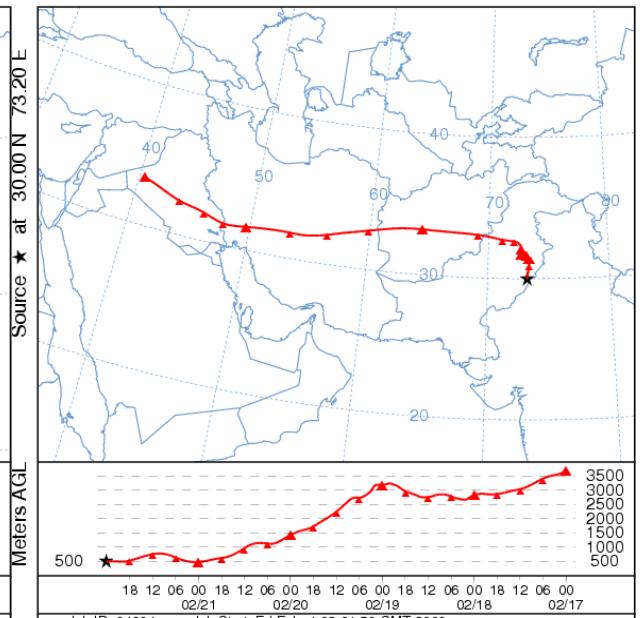
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 29 Jan 07
GDAS Meteorological Data



Job ID: 34059 Job Start: Fri Feb 1 01:49:49 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

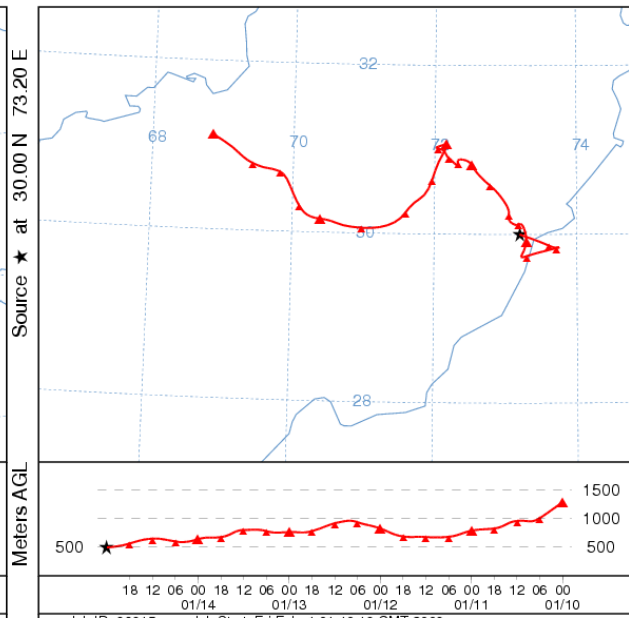
NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 22 Feb 07
GDAS Meteorological Data



Job ID: 34381 Job Start: Fri Feb 1 02:01:58 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

NOAA HYSPLIT MODEL
Backward trajectory ending at 00 UTC 15 Jan 07
GDAS Meteorological Data



Job ID: 33815 Job Start: Fri Feb 1 01:40:48 GMT 2008
Source 1 lat.: 30.0 lon.: 73.2 height: 500 m AGL

Trajectory Direction: Backward Duration: 120 hrs Meteo Data: GDAS1
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)

Crop Impact Assessment

- Pak-EPA eagerly look forward the out come of work being carried out at Botany Department, Punjab University, Lahore, Pakistan.

Health Impact Assessment

Research Study- Level of Exposure of School Children to Air Pollutants

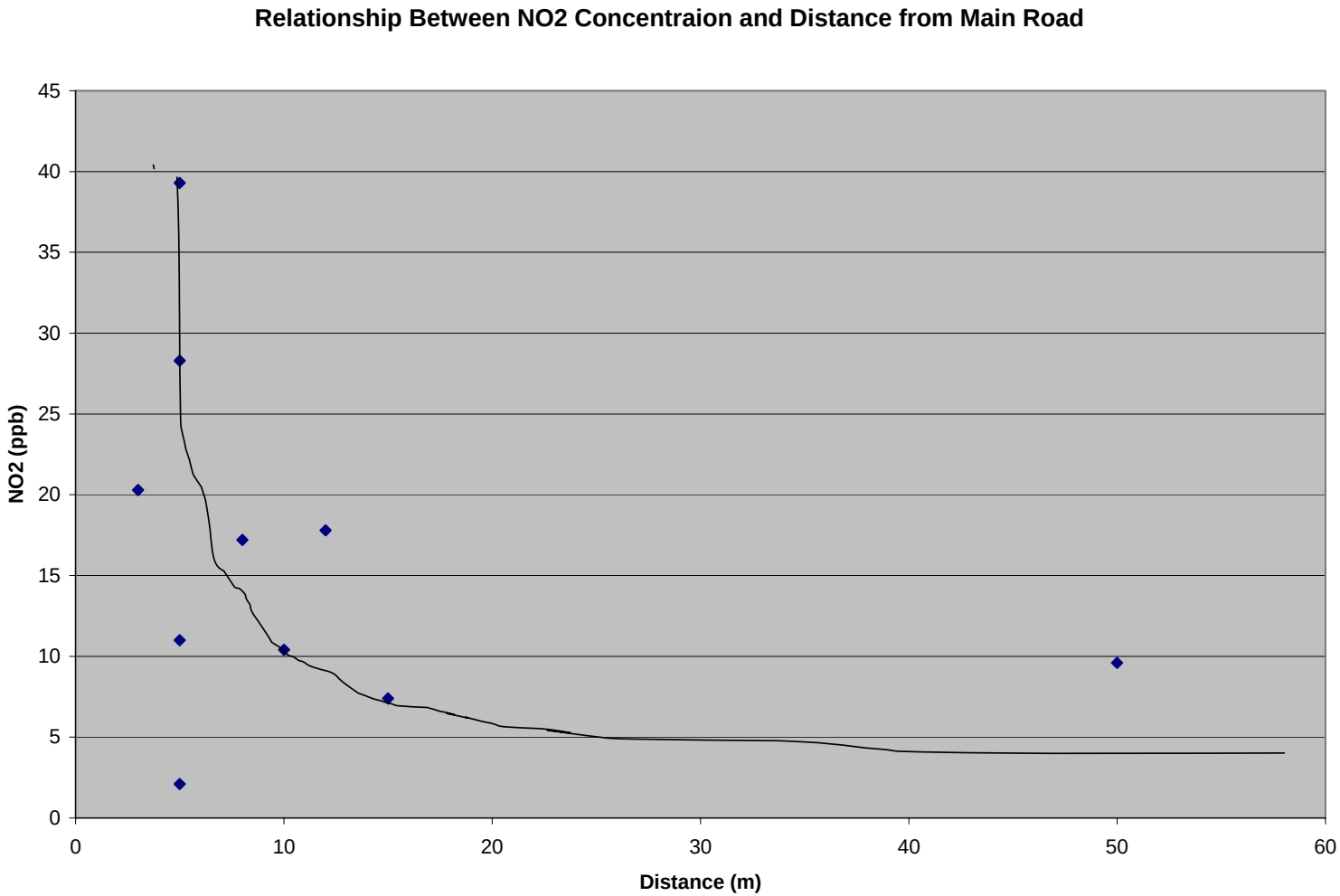
Objectives

- To Monitor the Level of NO_2 and SO_2 in Ambient Air in order to Know the Spatial Variation of this Important Traffic Related Air Pollutant.

- To Determine the Level of Exposure of School Children to Air Pollutants

Activities Undertaken

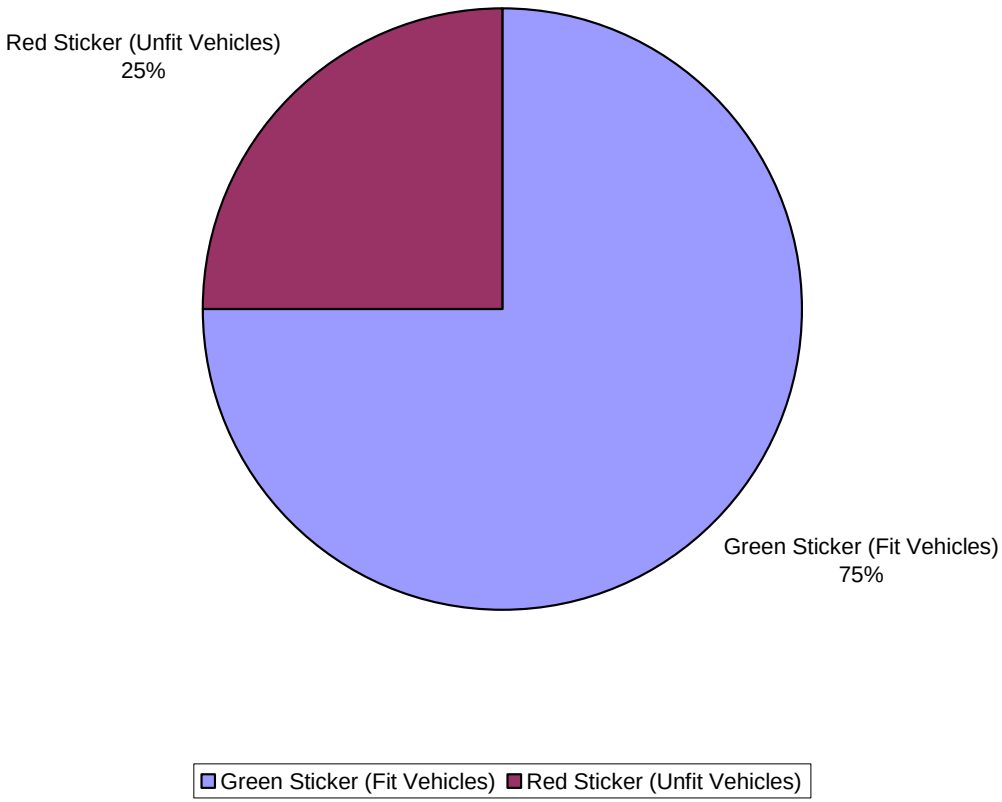
- A 5-Days Comprehensive Study has been Undertaken in Murree (Hill Resort) in September, 2007.
- 15 Locations were Selected for Ambient Air Quality Monitoring of NO_2 and SO_2.
- Vehicular Emission Testing was Also Done in that Area.
- Personal Passive Samplers were Attached to 37 Children to Monitor the Exposure Level.



Pak EPA

5RSC10IG

Testing Result of Petrol Vehices in Murree



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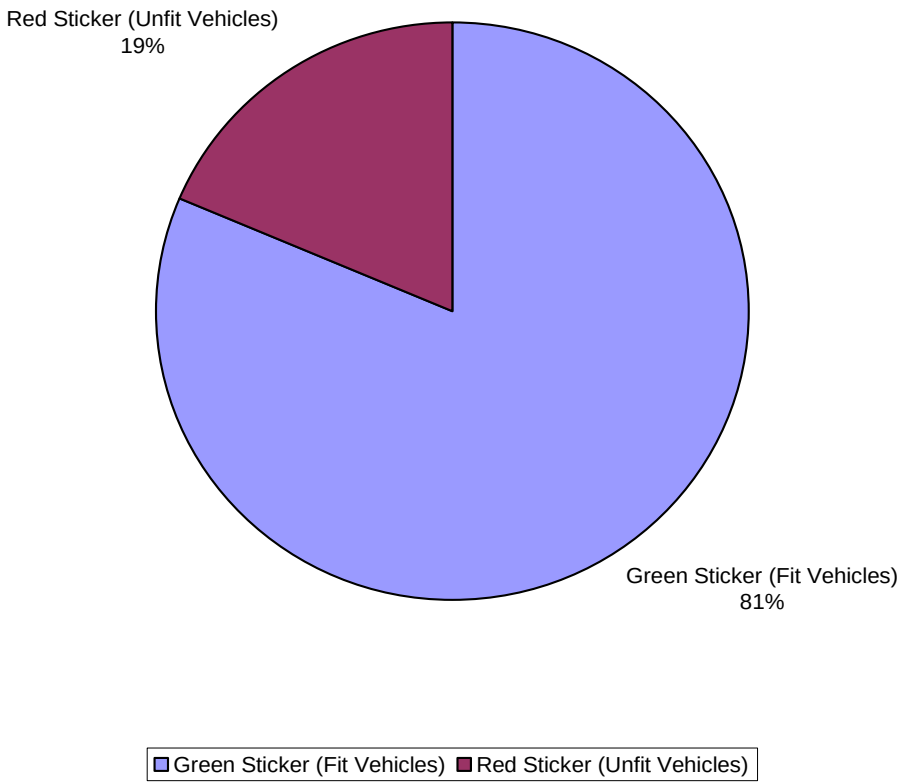
Testing Result of Diesel Vehicles in Murree



Pak EPA

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Results

- NO_2 and SO_2 concentration decreases with Increase in distance from the road.
- The samplers installed at more than 30 meters Distance from the road have More or Less Stable Concentration of NO_2 and SO_2 .
- Children of Schools Away from the Roadside Area are Less Exposed to Air Pollutants

Challenges & Difficulties

- Communication and Logistical Constraints for Supervising & Monitoring the Site
- Some Equipments Showing Sign of Wear – Tear
- Ground Staff Needs More Training
- Needs improved Coordination Among NIA and Expert Institute Nominated for Crop Impact Assessment

Plan for Next 3 Years

Corrosion Impact Assessment for Building Materials

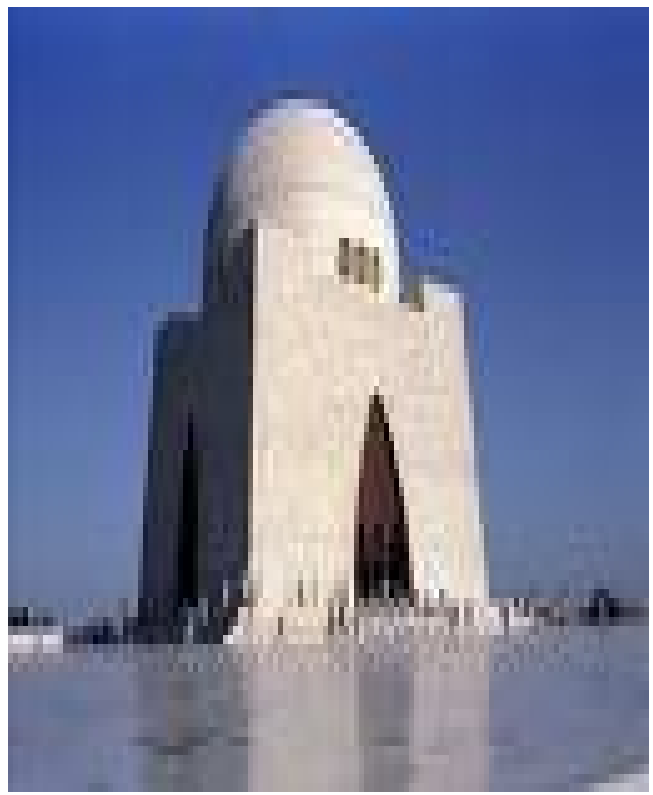
Objectives:

- To Determine the Effect of Acid Deposition on the Building Materials

- To Find Out Different Factors Responsible for Accelerating the Corrosion Rate of Buildings

Corrosion Impact on **National Mausoleum**

- It refers to the tomb of the founder of Pakistan-Mr. Muhammad Ali Jinnah.
- Established in 1970
- Total Visitors are 10,000.
- The mausoleum is made of white marble with curved Moorish arches and copper grills rest on an elevated 54 metre square platform.



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Corrosion Impact on Metals

- Objectives:
  - To Determine the Effects of Acid Deposition on the Transition Metals
  - To Find Out the Corrosive Agents
  - To Study the Anti-Corrosive Nature of Different Materials

Plan for 1st Year

- Transition Metals will be Exposed to Urban & Rural Environment
- Air & Soil Samples from the Sampling Sites will also be Collected (8 per Month).
- Equipment – to be Procured if Requirement.
- Setting up / Installation of Equipment in Laboratory / Field as per Requirement
- Review of Literature

Cont…

- Dry and Wet Deposition Analysis will be Done for the Monitoring Area

- The relationships between acidic pollutant levels and weight loss for Transition Metals will be Quantified.

Plan for 2nd Year

- Experimental Study to be Undertaken
- Analysis for Air Samples for Different Pollutants
- Analysis for Soil Samples for Metals
- Analysis of Rust for Complex Formation
- Study of Anti-Corrosive Metal Agents

Plan for 3rd Year

- Result Analysis
- Interpretation
- Report Writing
- GIS Development
- Report Submission

Soil Impact Assessment

Objectives:

- To Determine the Extent of Absorption of Acids in Soil
- To Find Out the Sensitive Areas for Soil Acidification

Soil of Pakistan

- The overall soil of Pakistan is alkaline in nature its pH range is 8.3 to 8.8
- Soil of Pakistan is of three types

i) Sand ridges

- It is desert type its pH range is 8.3

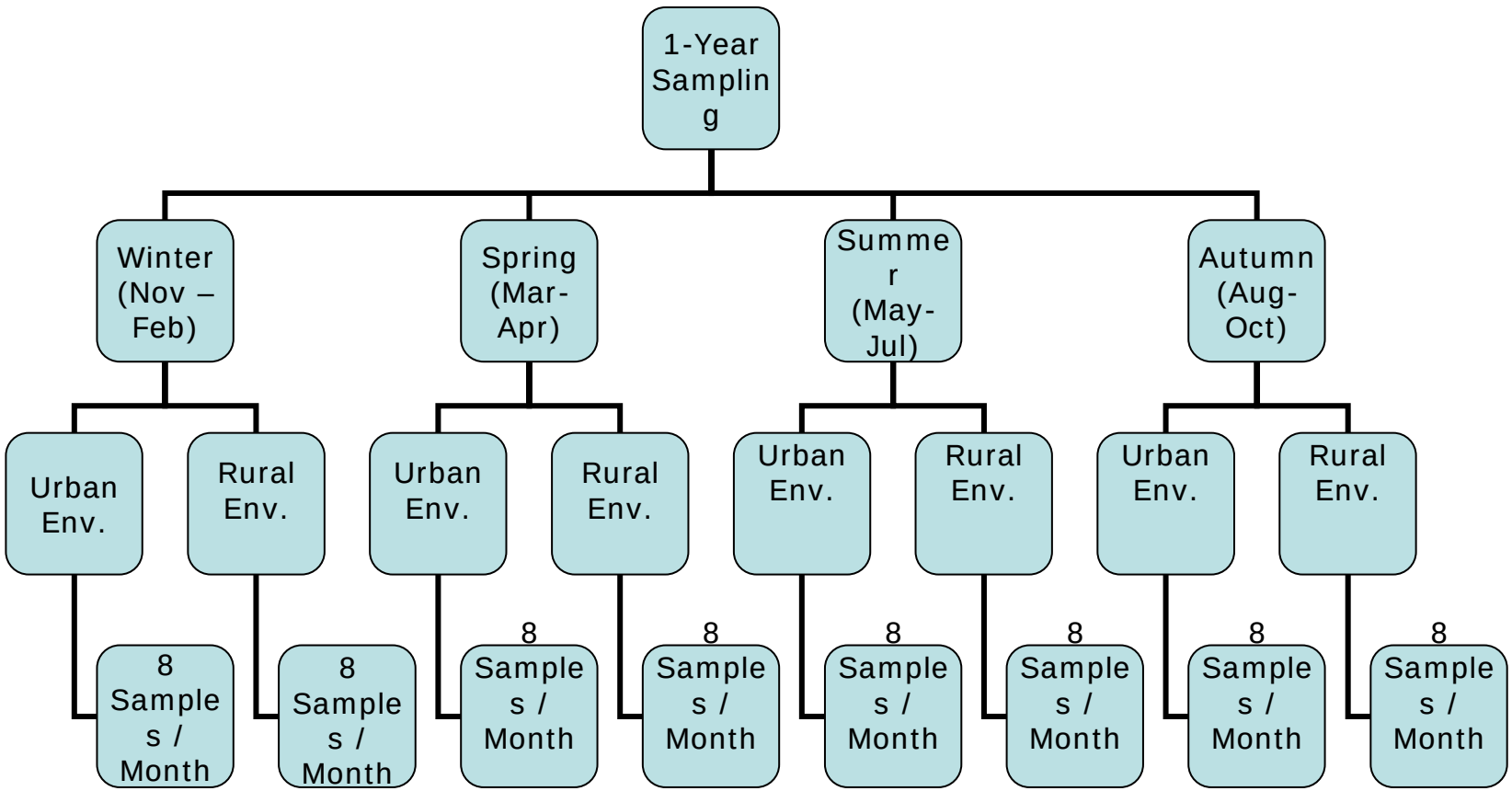
ii) Abandoned channels

- It is channels of deposited materials which is loamy fine sands to silty clays

iii) Flood Plains

- Soil sub recent flood plains moderately deep to deep , dark greyish brown, silty clay loams, and silty clays with week to moderate structure.

Sampling Plan



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Activities

- Soil Samples will be Taken from All Over Pakistan
- Soil Characterization will be Done
- Soil will be Analyzed for Absorption Capacity for:
  - Organic & Inorganic Acids
  - Chemicals Under Rotterdam Convention

Health Impact Assessment

- A Study on impacts of Air Pollution on health will be Undertaken.
- This Study will be Undertaken on Traffic Police.
- They will be Monitored for 1 year by Medical Check ups.
- Air Monitoring Data will also be Collected for those Areas.

Thanks

Pak EPA

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