

Emission Inventory of Pakistan 2004-05

By

Sajjad **S**aeed

Ambreen **T**ariq

**2nd Malé Declaration emissions inventory
workshop (26th Feb – 2nd March 2007), AIT
Bangkok.**

Introduction

- ▮ Pakistan is located within the latitudinal and longitudinal extensions 24°N to 37°N and 61°E to 76°E respectively
- ▮ The country is located in sub-tropics as well as in temperate region
- ▮ Total Population of Pakistan is 151.55 millions (78.86 m Males and 72.69 m Females).
- ▮ Total number of registered vehicles in Pakistan is 5209016.
- ▮ Total Road Length is 259758 km (162879 High type and 96879 Low type).
- ▮ Approximately 36 groups of small and large industries are working in the country.

Physiographic Map of Pakistan



Environmental Issues in Pakistan

- Unchecked use of hazardous Chemicals, vehicle emissions and Industrial activity has contributed to a number of Environmental issues and health hazards (such as water pollution).
- Much of the country lacks potable water owing to the industrial waste and agricultural runoff that has contaminated the drinking water.
- The widespread use of the low quality fuel combined with a substantial increase in the number of vehicles has led to significant air pollution

(U.S Energy Information Administration 2005).



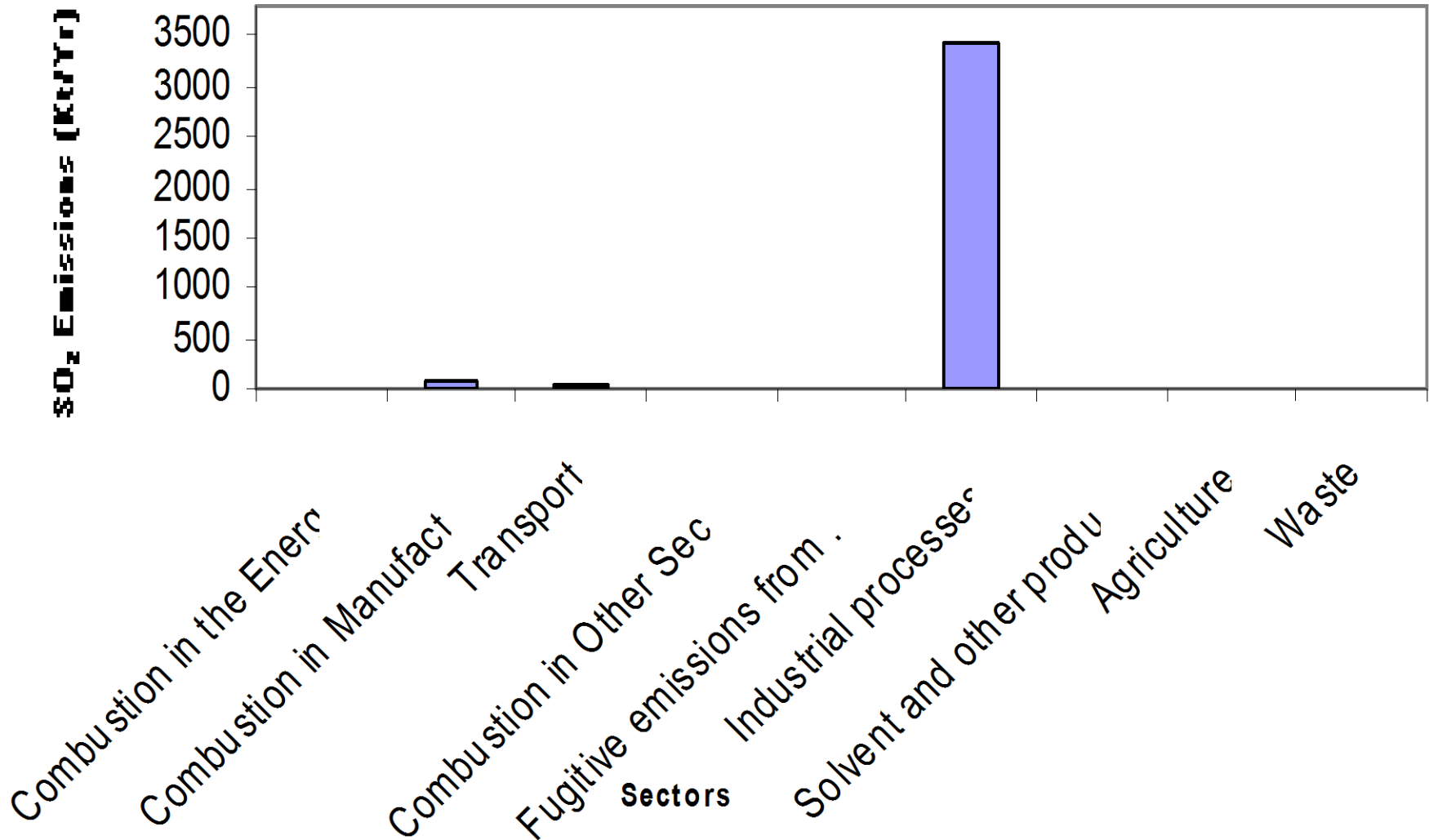
Data Used

- Data of 2004-05 was used to prepare Emission Inventory.
- Major portion of data was collected from Pakistan Statistical Year Book 2006.
- Fuel data was collected from Pakistan Energy year Book 2005.
- Data from some other sources available on internet for the above period was also used.

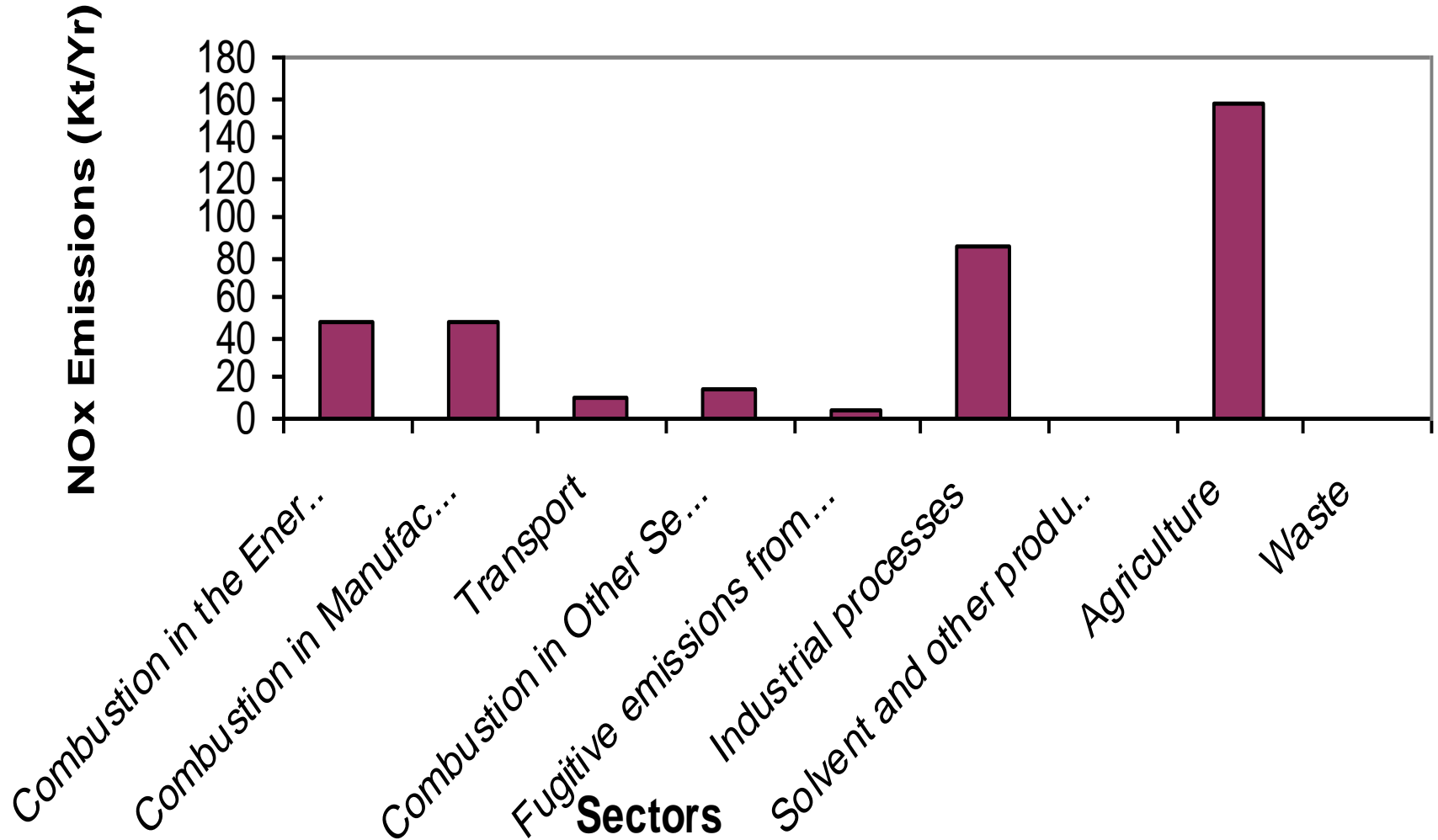
Emissions from Different Sectors

	SO2	NOx	CO	NMVOC	NH3	PM10	PM2.5
Combustion in the Energy Industries	1.29	47.82	8.73	2.19	0.00	1.05	1.05
Combustion in Manufacturing Industries	81.47	48.60	27.86	3.95	0.00	21.55	9.17
Transport	47.03	11.51	2.06	151.05	0.00	363.72	126.35
Combustion in Other Sectors	2.25	14.58	22.17	1.11	0.00	0.12	0.11
Fugitive emissions from fuels	2.59	4.75	0.29	135.28	0.00	2.41	1.24
Industrial processes	3417.78	86.43	1523.85	136.46	0.00	630.88	109.86
Solvent and other product use	0.00	0.00	0.00	11.27	0.00	0.00	0.00
Agriculture	7.61	157.12	1021.02	142.66	2131.55	97.50	97.50
Waste	0.00	0.00	0.00	0.00	157.78	0.00	0.00

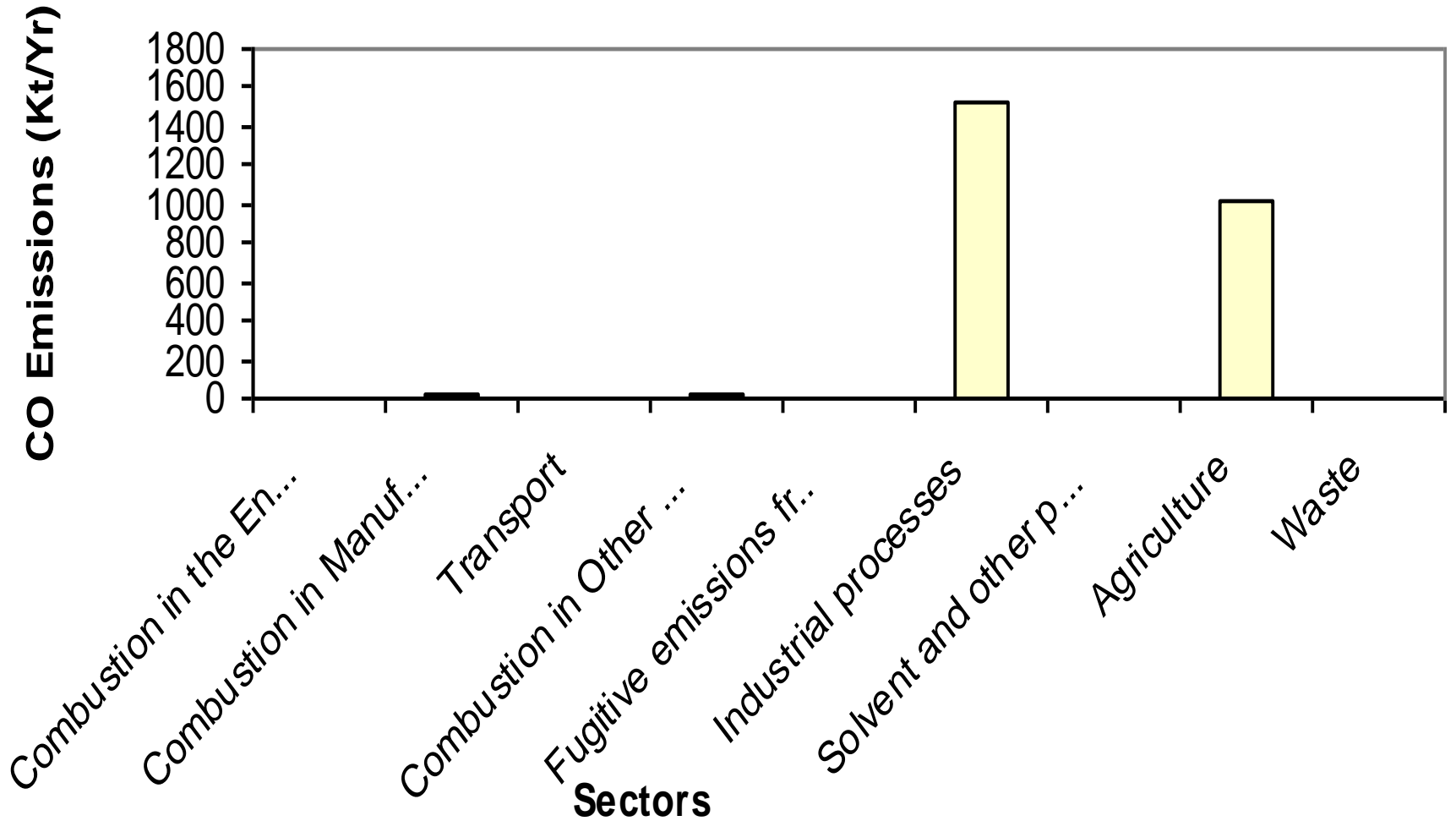
SO₂ Emissions (Kt/ Yr)



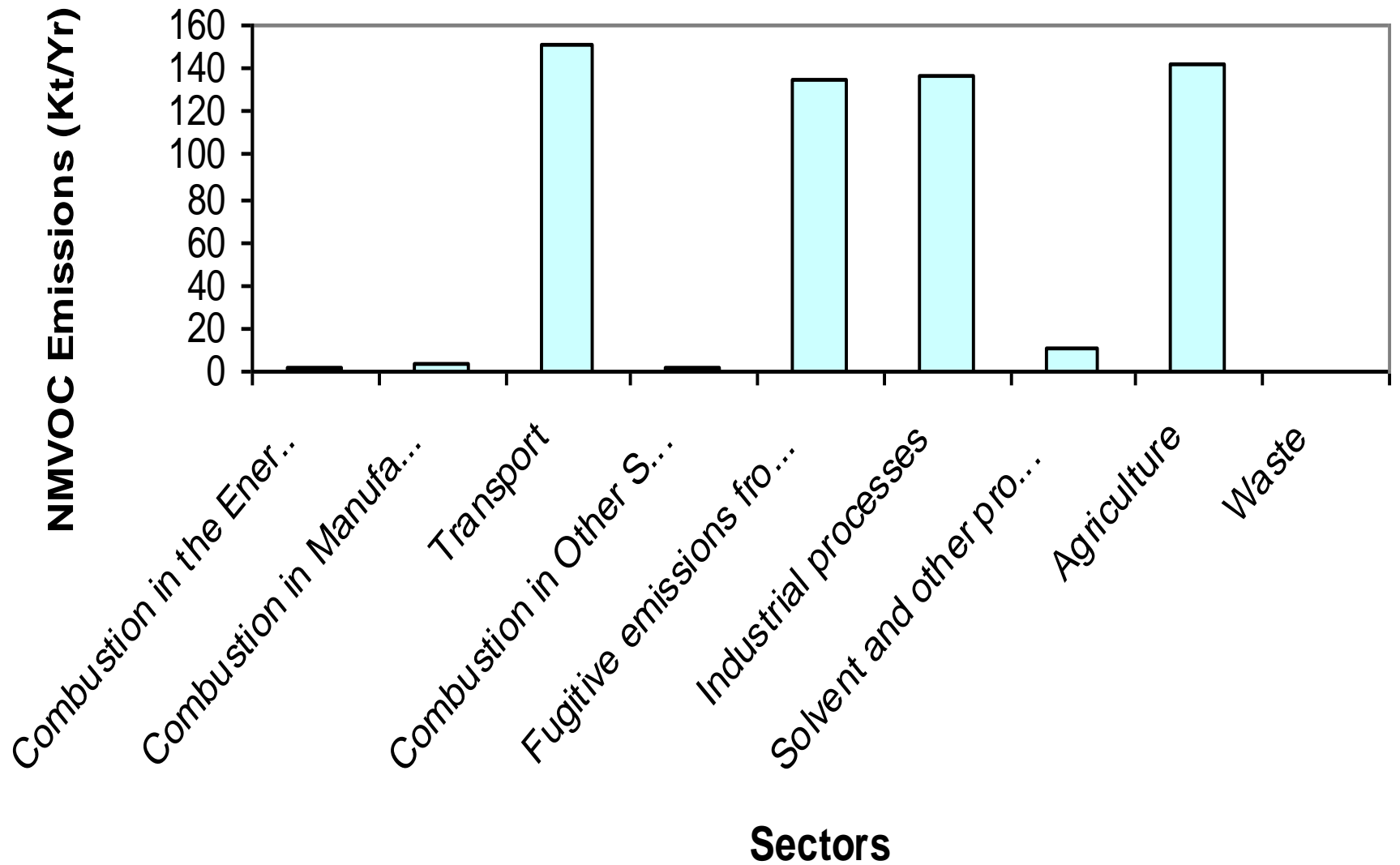
NOx Emissions (Kt/Yr)



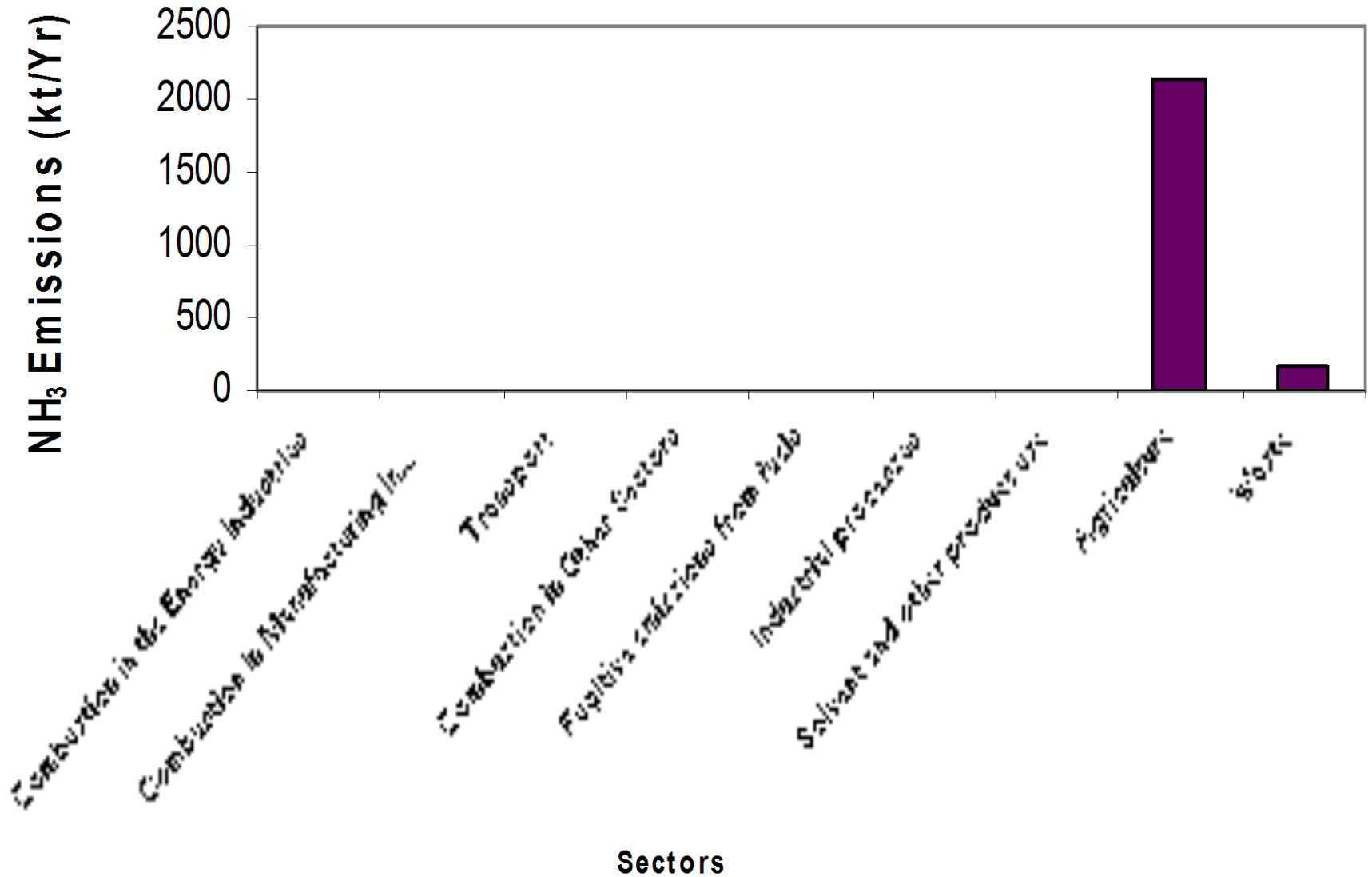
CO Emissions (Kt/Yr)



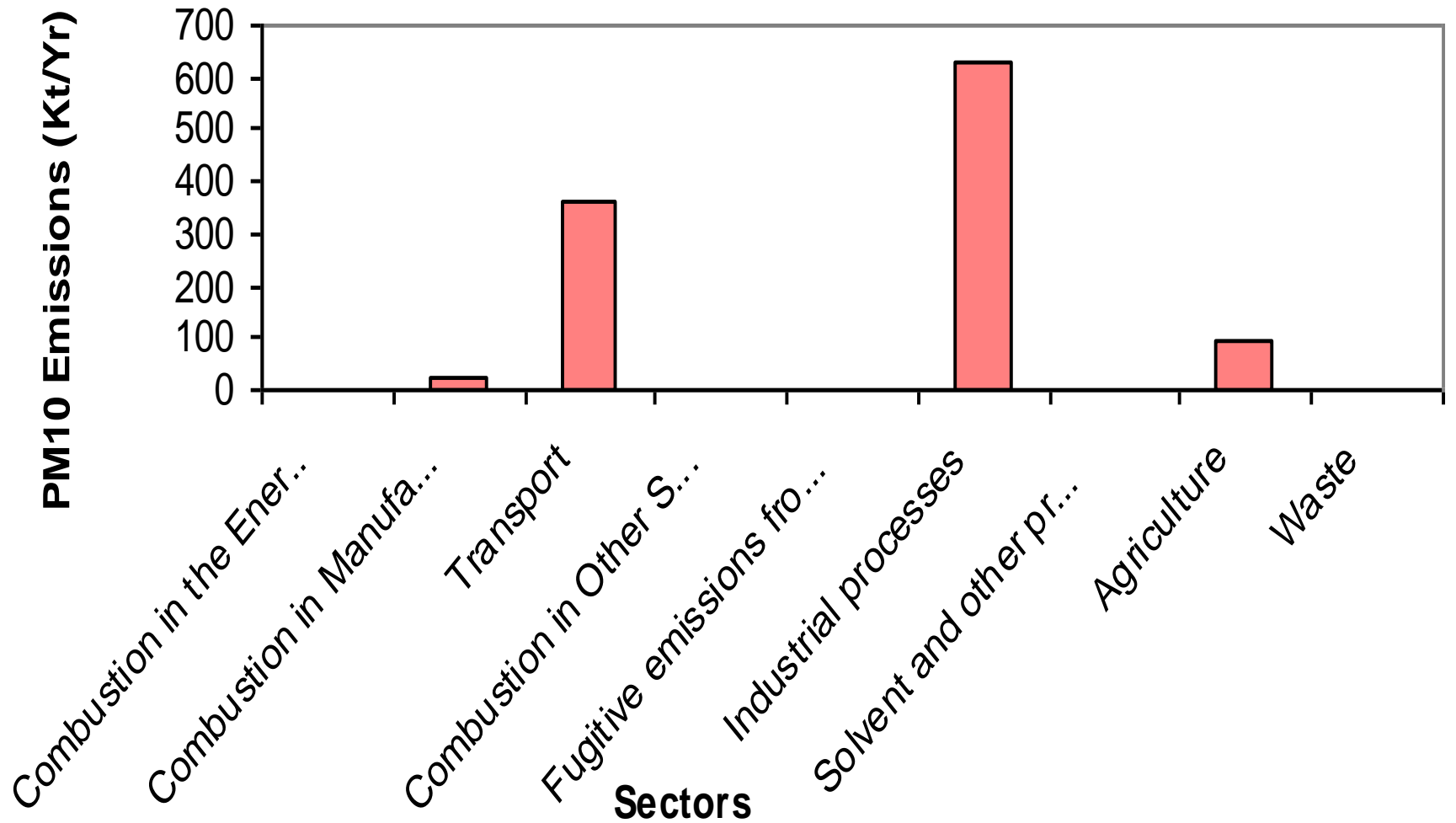
NMVOC Emissions (Kt/Yr)



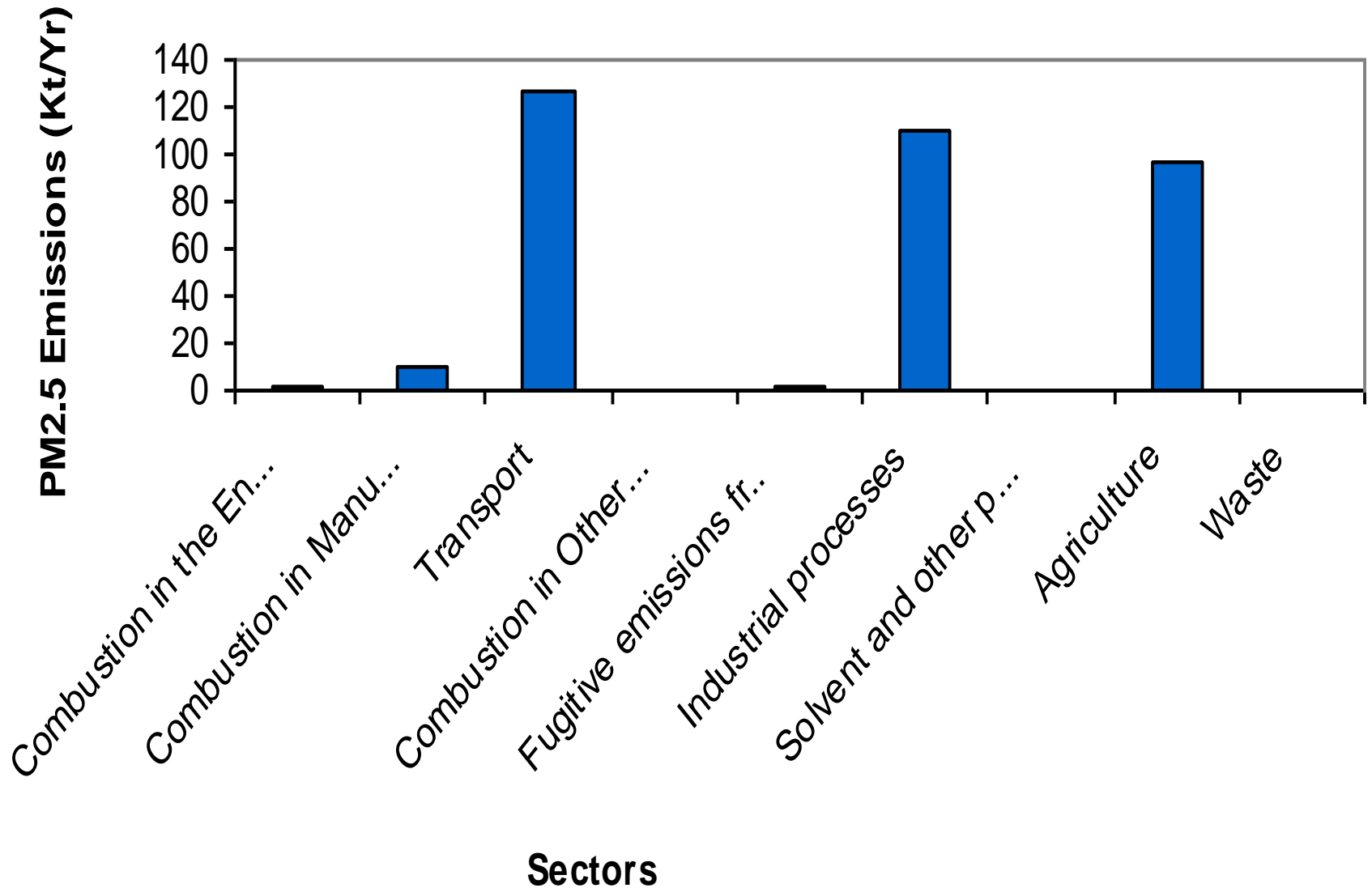
NH₃ Emissions (Kt/Yr)



PM10 Emissions (Kt/Yr)

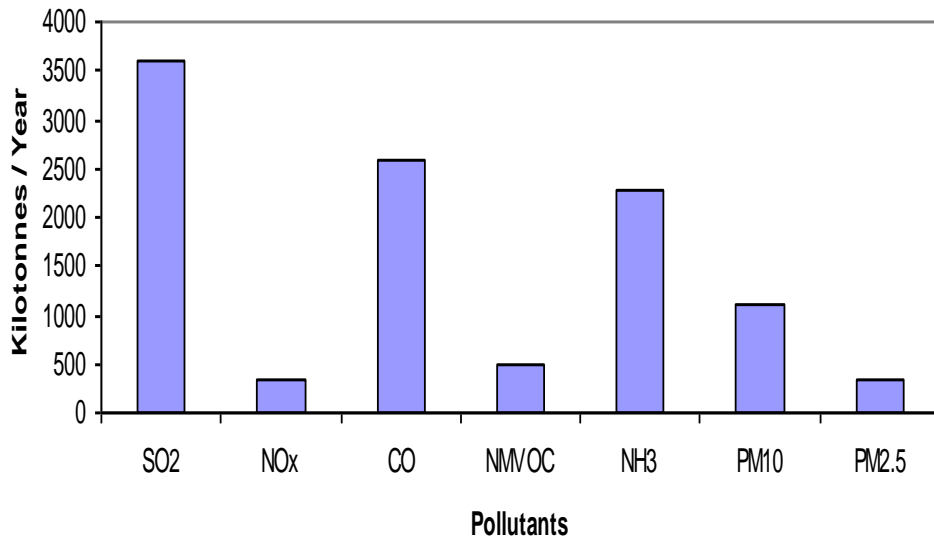


PM2.5 Emissions (Kt/Yr)

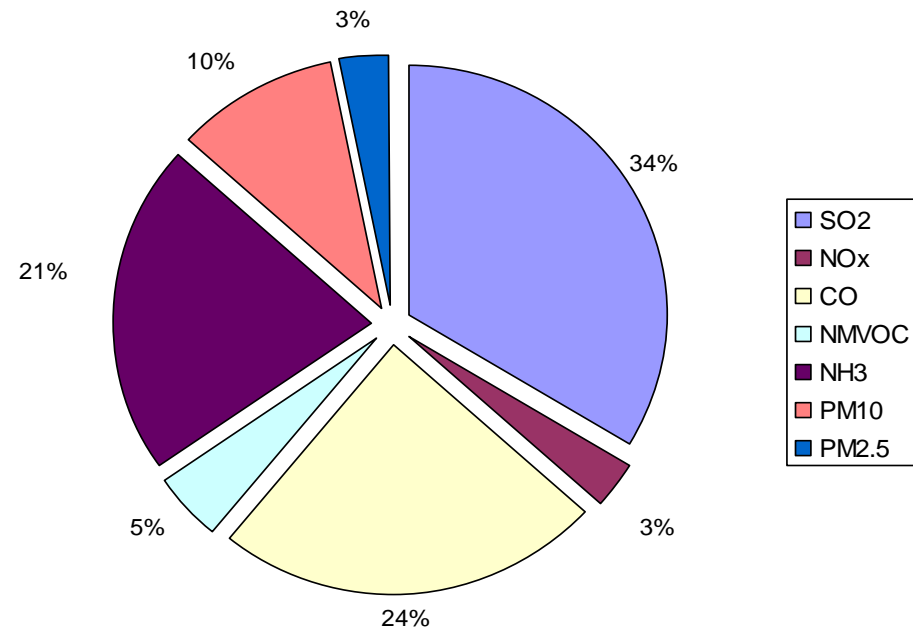


Total Anthropogenic Emissions

Total anthropogenic Emissions during 2004-05



Total anthropogenic Emissions



Conclusions

- The major pollutant emitted from different sources in Pakistan are SO_2 , CO , NH_3 and PM_{10} .
- The major source of SO_2 and CO are the industrial processes which includes the production of metals, mineral products, chemicals etc.
- Maximum emission of NH_3 is from Agriculture sector due to excessive use of N-containing fertilizers, manure management and burning of agriculture crops residue.

Problems Encountered

- Lack of relevant activity data. The data available was not in proper format.
 - The sector 'Vegetation Fires and Forestry' and sub sector 'Waste incineration' are not covered due to unavailability of data.
 - Country specific emission factors are not available.
- 