

AN INTEGRATED MODELING APPROACH TO FORECAST THE AIR QUALITY FOR A MEGA CITY IN ASIA FOR COMMONWEALTH GAME 2010

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INTRODUCTION

System of Air quality Forecasting And Research (SAFAR), a pilot project of IITM (MoES, Govt of India) and GURME of World Meteorological Organization has been implemented in a Mega city Delhi during the Mega international sports event (CWG-2010).

WHAT IS SAFAR ?

AIR QUALITY INFORMATION SERVICE IN A MISSION MODE WITH A FOCUS TO FORECAST AIR OF TOMORROW

POLLUTANTS: O₃, NO_x, CO, PM_{2.5}, PM₁₀, BC, BTX

- (1) Weather Forecasting Model: Drives Air Pollutants
- (2) Monitor Weather Parameters (24x7) -35 AWS
- (3) High resolution Emission inventories –Drives Forecast
- (4) Air Quality Forecasting Model (2 for redundancy)
- (5) Monitor Air Pollutants Strategically (24x7) -11 Stations
- (6) Reaching to Public-
 - (a) Translate Data to Information: Developed AQI Concept
 - (b) Issue Advisories & Alerts: Advise on Health via AQI

FORECASTING SYSTEM– MODEL ING

SYSTEM-1:

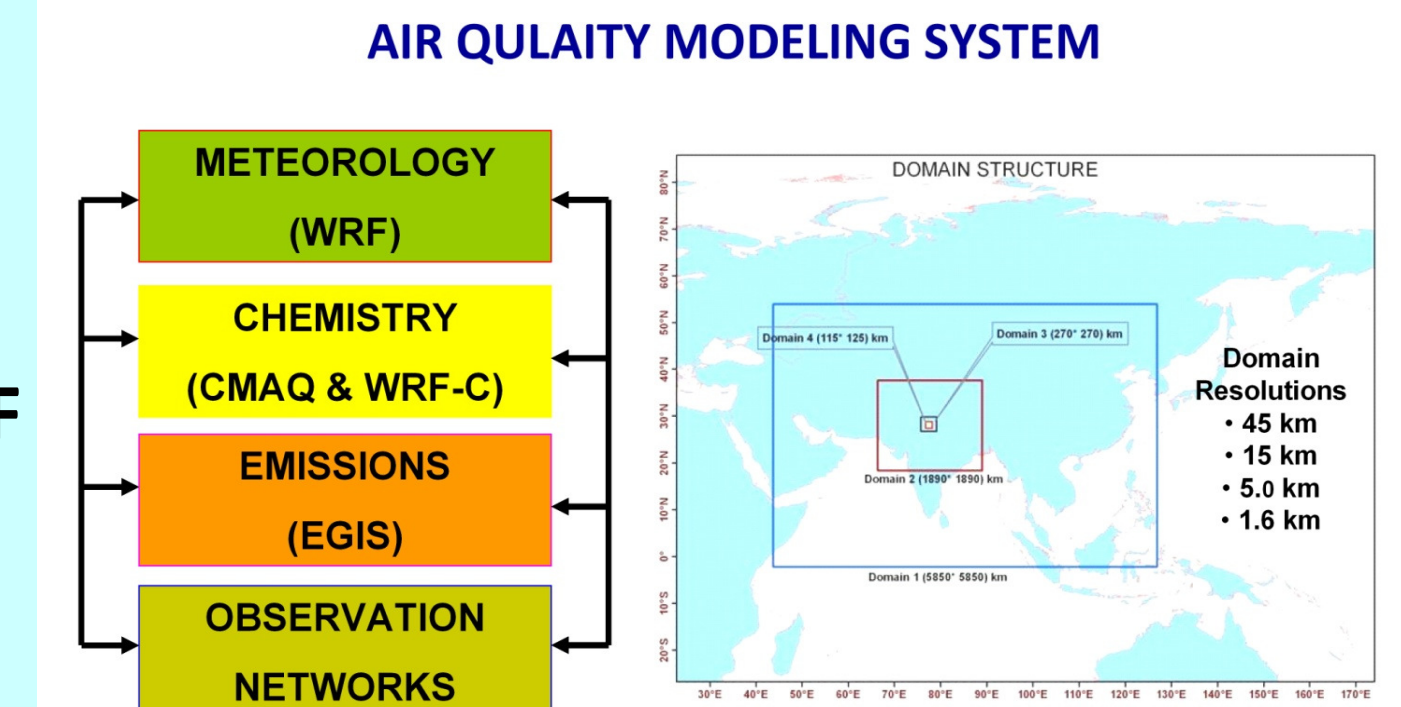
- Meteorological Model -WRF
- Emission Model –GIS based Statistical Model (EGIS)
- Atmospheric Chemistry Transport Model –WRF-CHEM

Complete System: WRF-CHEM-EGIS

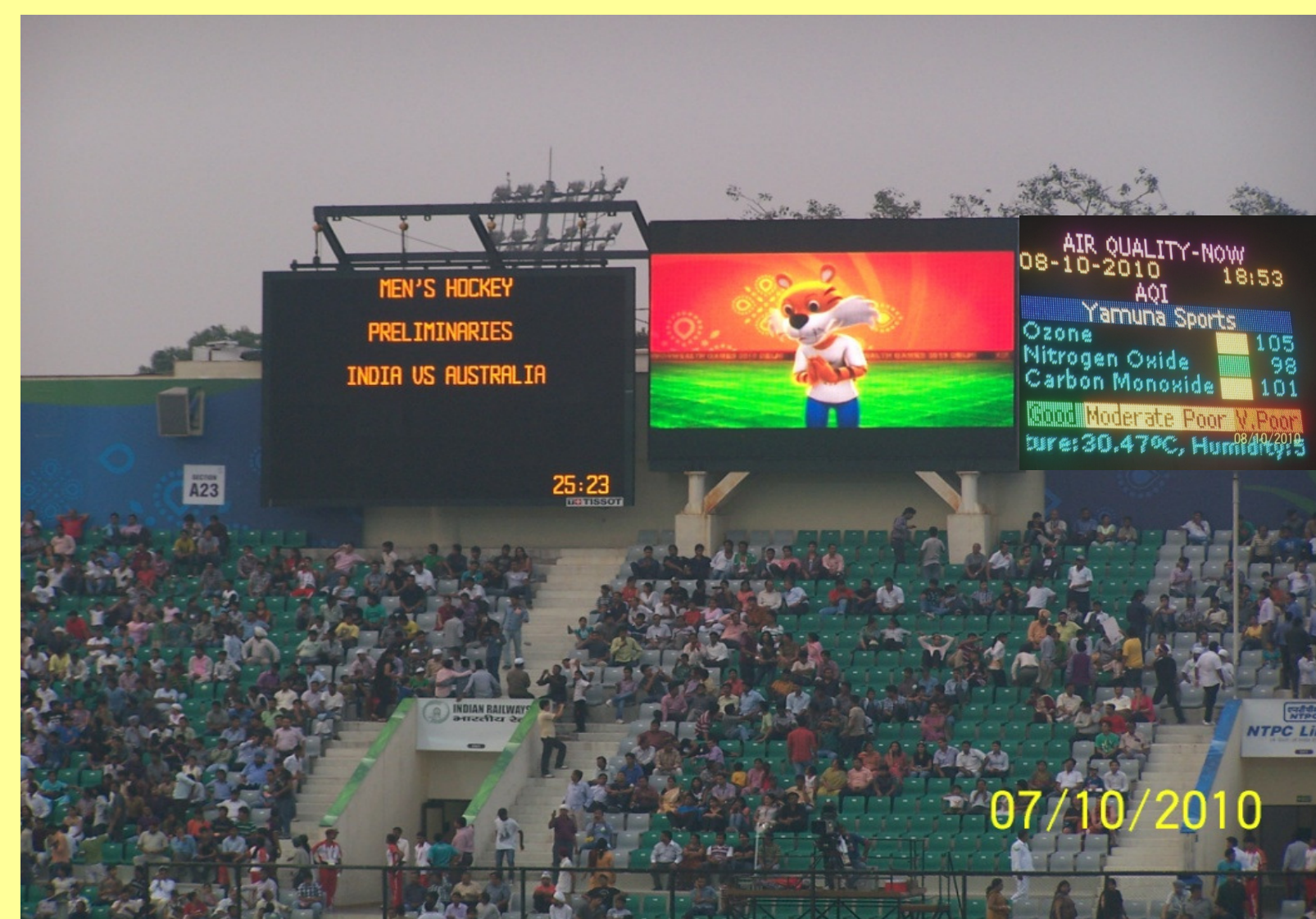
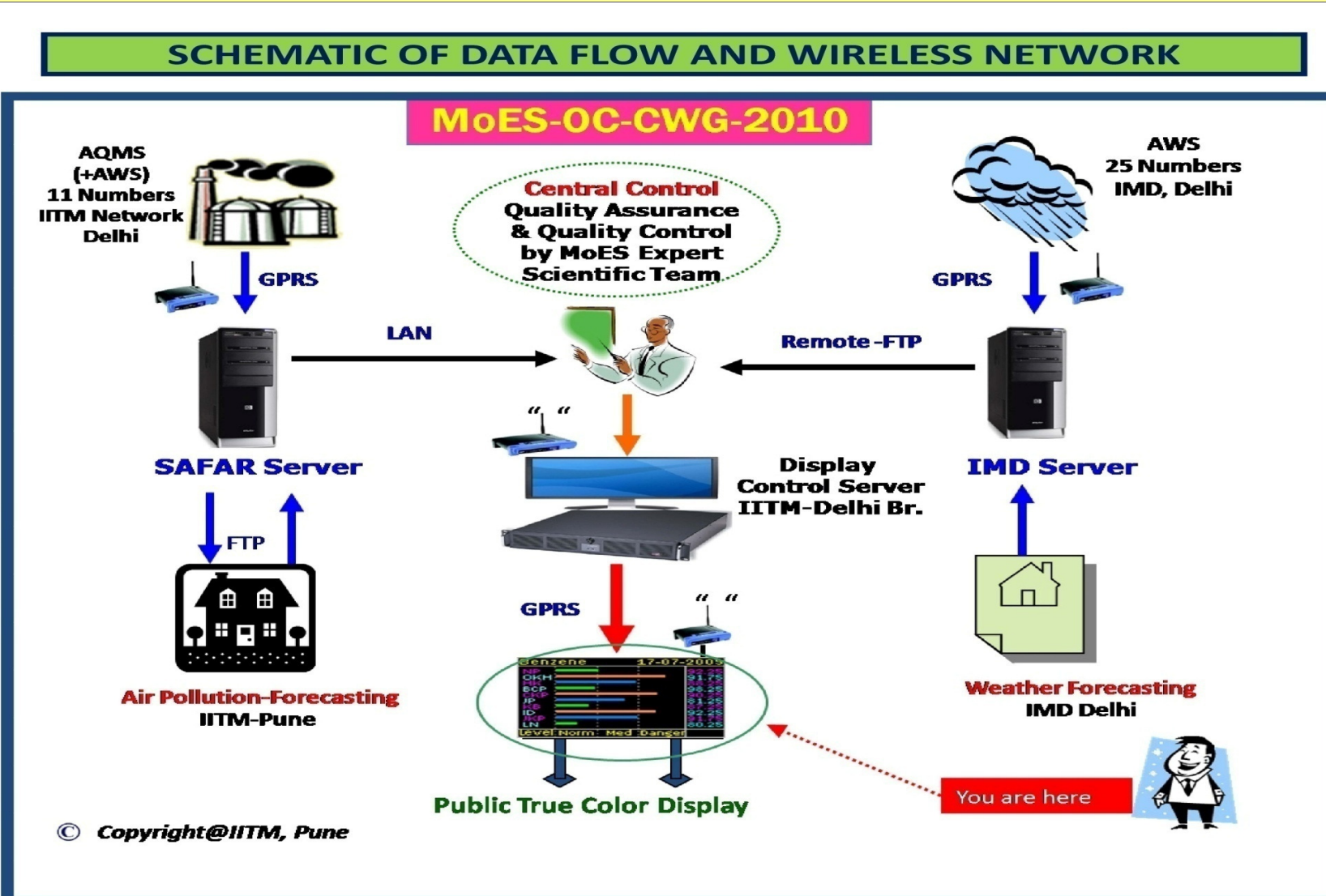
SYSTEM-2:

- Meteorological Model –REMO /WRF
- Emission Model –GIS Model (EGIS)
- ACT- Model -CMAQ

Complete System: REMO /WRF-CMAQ-EGIS



COMPONENTS OF SAFAR SYSTEM



EMISSION INVENTORY OF POLLUTANTS

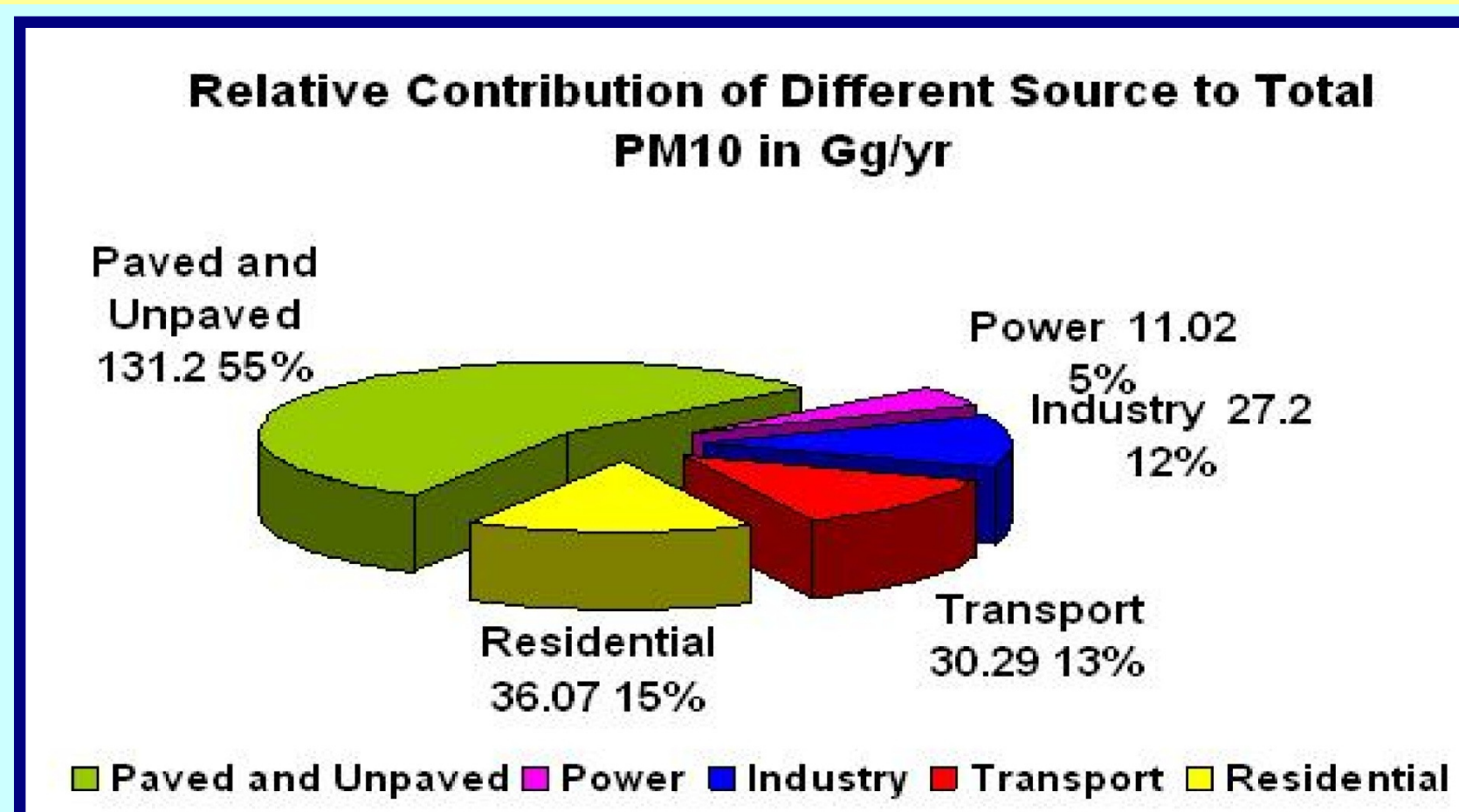
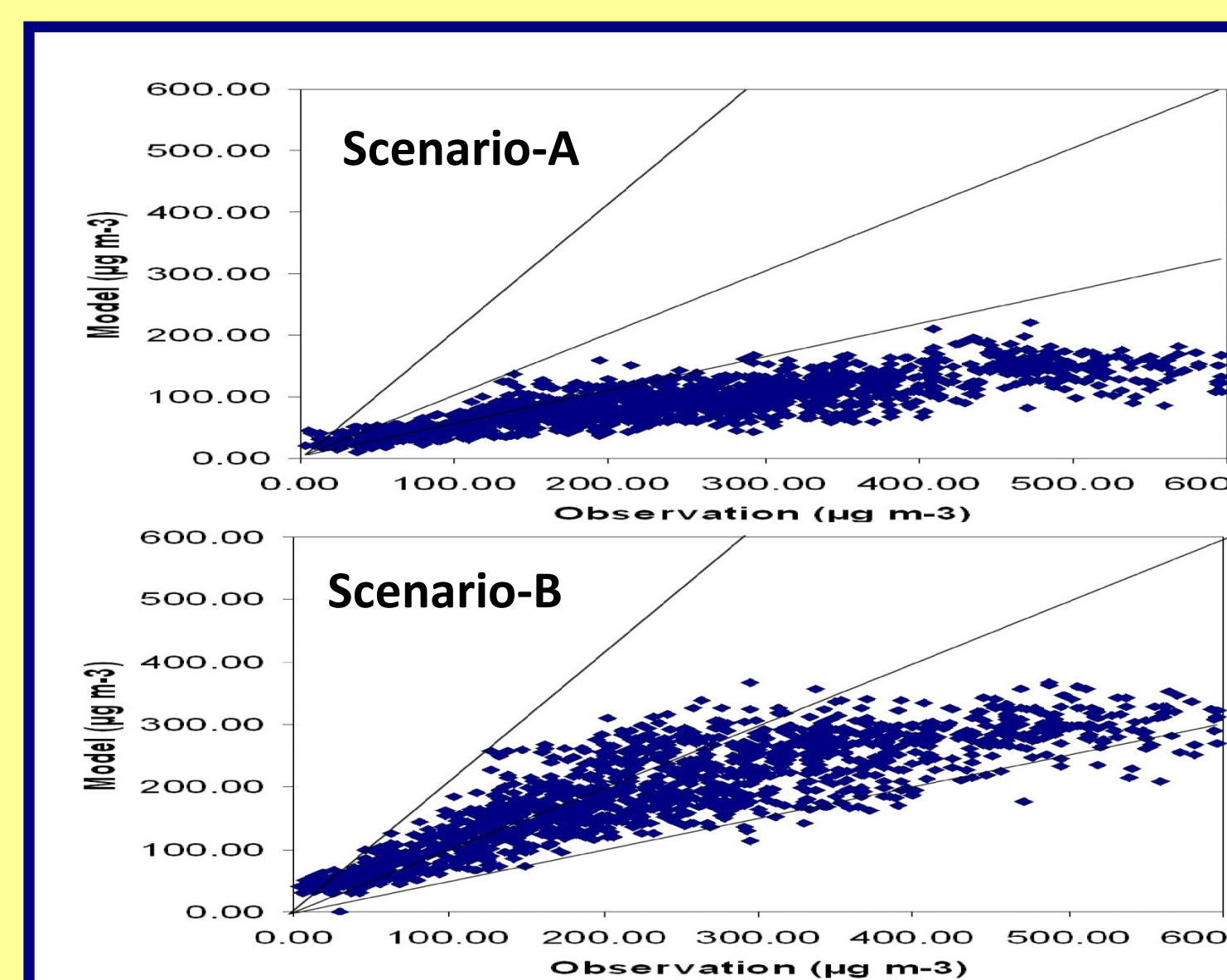


Figure : Relative contribution of various Emission sources in Delhi-NCR with Windblown Dust. From paved and unpaved Road

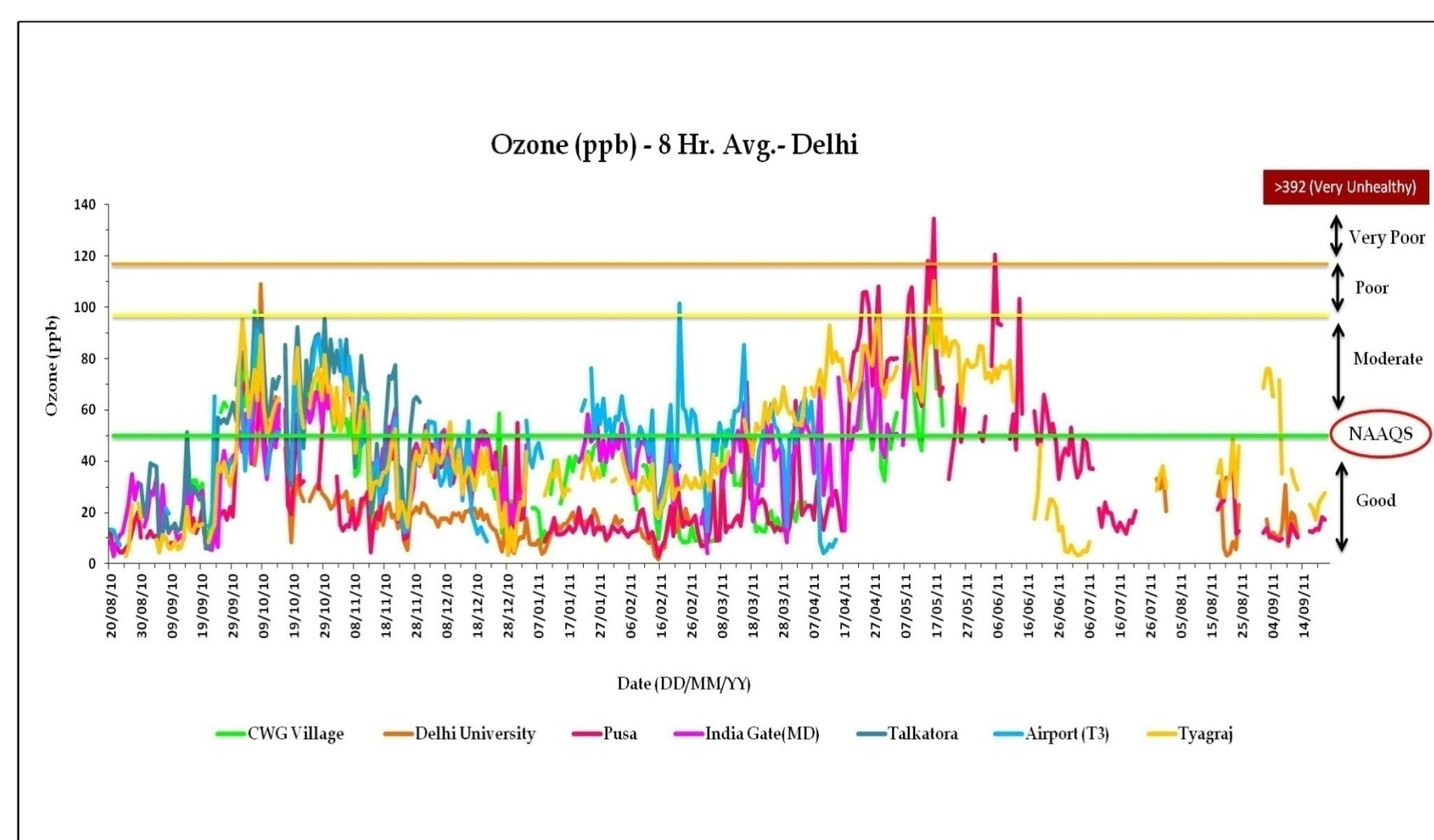
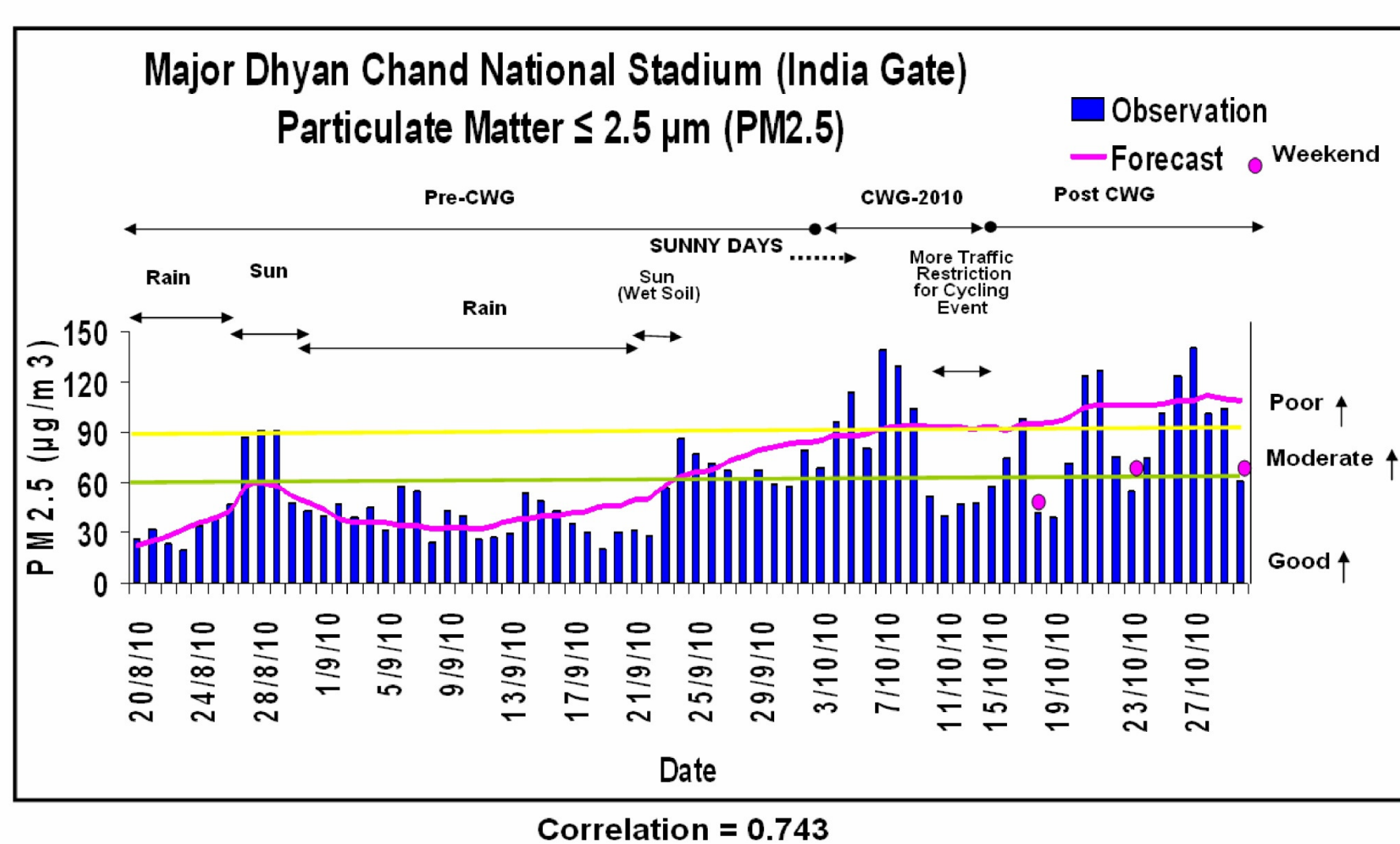
MODEL VALIDATION



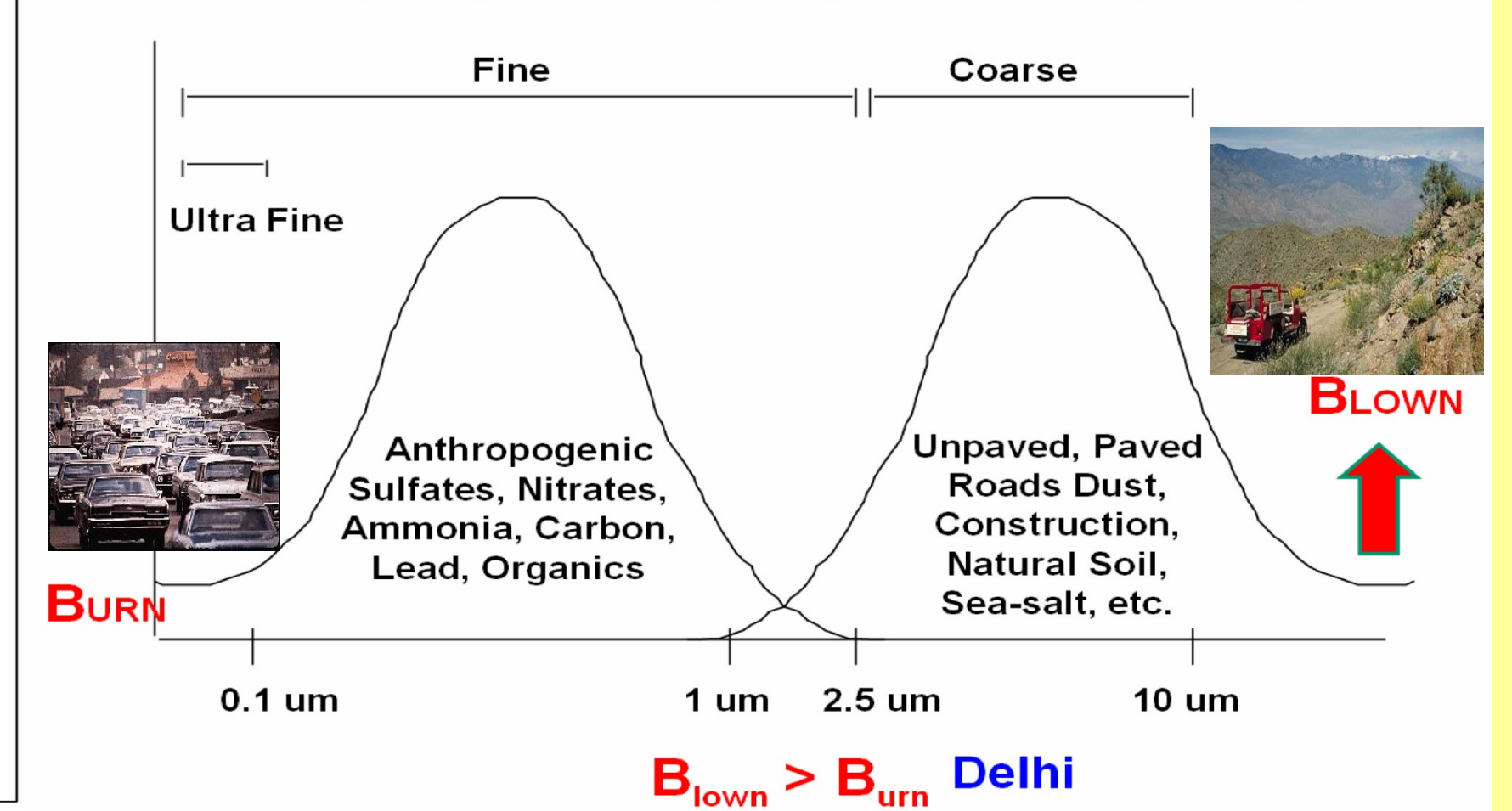
Scatter plots of simulated versus observation PM₁₀ concentration under scenario-A (when wind blown dust is not considered) and scenario-B (when wind blown dust is accounted in the model).

Correlation Coefficient (B) = 0.571

RESULTS



Conclusion: Control Two B_s



CONCLUSIONS

- (1) Emission from the unattended source like windblown dust from paved and unpaved roads is found to be the major contributor in PM₁₀ and PM_{2.5} emissions in Delhi and inclusion of this sector helped in better forecasting skill.
- (2) Particulate pollution is a major problem for Delhi specially during winter and fire event festival. However the status of gaseous pollutants is reasonably better, especially the ozone pollution is within the good to moderate range excepting some sporadic occasions during the past one year (2010-2011) in Delhi.