*Evaluation Report on Project*

# INSTALLATION OF SPM DISPLAY BOARDS AT THREE POINTS IN LAHORE


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# 1. INTRODUCTION

This evaluation report is aimed at assessing and evaluating the project ***"INSTALLATION OF SPM DISPLAY BOARDS AT THREE POINTS IN LAHORE"***.

The evaluation is conducted after the project closeout stage with an intention to review the implementation process, results achieved and to infer lessons. Its focus is primarily on the efficiency, effectiveness and sustainability criteria. The evaluation report will portray the mapping of the project purpose, scope and objectives as planned and approved in PC-I with the actual execution and implementation in order to assess whether the project has been successfully completed.

As per Original PC-I the project start date was 01st July 2004 and completion date was 30th June 2005 and as per actual, project was started in June 2006 and completion date was 30th June 2009. The original project cost was Rs. 5.000 million, revised planned cost was Rs. 6.60 million and PC-IV actual cost is Rs. 4.800 million.

This evaluation report is divided into seven different parts. After Introduction, it starts with project description and states project brief, project background, objectives, project activities and project cost.

The 3rd part of this report focuses on methodology that describes how evaluation is carried out following formation of evaluation plan, unit team constitution, choices of data collection methods used for evaluation purposes.

The fourth part of the report presents the observations and information from data collected in the data collection phase i.e. during field visits and interviews with project stakeholders.

The fifth part comprises conclusions that will document the evaluation results and discuss the reasons for success or failure of the project.

The sixth part of the report has recommendations for the effective usage of the project outcomes and resources. This section addresses the suggestions for improvement in project planning and execution as well as, identifying matters requiring follow up actions. The rationale for the recommendations is clearly explained and linked with the information collected in the evaluation.

The seventh and the critical part of the report describes the lessons learned aimed at improving development plans and strategies for other projects and how to facilitate project execution by applying good management practices.

# 2. PROJECT DESCRIPTION

Following is the project information as per PC-I & PC-IV.

## 2.1 PROJECT BRIEF

| | |
|---|---|
| **PROJECT TITLE** | INSTALLATION OF SPM DISPLAY BOARDS AT THREE POINTS IN LAHORE |
| **SPONSORING AGENCY** | EPD, Government of the Punjab. |
| **EXECUTING AGENCY** | EPA, Government of the Punjab. |
| **OPERATIONS & MAINTENANCE** | EPA, Government of the Punjab. |
| **PC-I ORIGINAL COST** | Rs. 5.000 million |
| **PC-I REVISED COST** | Rs. 6.600 million |
| **PC-IV ACTUAL COST** | Rs. 4.800 million |
| **ORIGINAL PC-I START DATE** | 1st July 2004 |
| **REVISED PC-I START DATE** | 1st July 2007 |
| **PLANNED END DATE ORIGINAL PC-I** | 30th June 2005 |
| **PLANNED END DATE REVISED PC-I** | 30th June 2009 |
| **ACTUAL START DATE** | June 2006 |
| **ACTUAL END DATE** | 30th June 2009 |
| **PLANNED GESTATION PERIOD** | 12 Months |
| **REVISED GESTATION PERIOD** | 24 Months |
| **ACTUAL GESTATION PERIOD** | 37 Months |
| **END USERS** | People of Lahore, Policy makers |

## 2.2 BACKGROUND

This scheme "Installation of SPM Display boards at Three Points in Lahore" was initially conceived in 2004 with an aim to promote education and awareness in general public and generation of data on long term basis. The major activities in the original scheme were the procurement of Suspended Particulate Matter (SPM) monitor and one display board. The original planned cost of this scheme was Rs. 5.0 million. Later, JICA funded another scheme in collaboration of EPD and donated three Automatic/Fixed Air Quality Monitoring Stations (2 Fixed and 1 mobile station). The two fixed stations were placed each at Town Hall, Town Ship and one mobile station is placed at EPD. The provision of these three monitoring stations raised the need to revise the scheme thus eliminating the need to procure the monitoring station along with following changes in the scope and cost;

- The name of the scheme was changed to "Installation of SPM Display Boards at three Points in Lahore" from the original name "Installation of SPM System in Lahore".
- The monitoring equipment was excluded.
- The numbers of display boards were increased from one to three boards.
- The cost of the project was increased to Rs. 6.6 million from Rs. 5.0 million.

## 2.3 JUSTIFICATION OF THE PROJECT

Consistent data on status of air pollution in Pakistan has been scant due to unavailability of proper measurement facilities. JICA has donated three monitoring stations for air quality monitoring. These are working at three places in Lahore. These are producing continuous data of various pollutants of public concern. In the light of EPA collected data from different urban centers in Punjab, air pollution has been emerging as challenge to public, and government agencies.

In Pakistan, the problems of air pollution are restricted to urban centers. The main factors responsible for air pollution are the rapid growth in the number of motor vehicles and industry. Use of gasoline and diesel by motor vehicles and traffic jams, poor maintenance of commercial vehicles and excessive vehicular emission are resulting in air pollutants like suspended particulate matter, ozone, carbon monoxide, oxides of nitrogen, hydrocarbons, sulfur dioxide and smoke.

EPA Punjab collects data on ambient air quality in 34 districts of the Punjab using Mobile Station on 24-hour basis. The data indicates that the levels of particulate matter exceed WHO/EPA USA Ambient Air Quality Guidelines/Standards, at all sites and levels of nitrogen oxide and hydrocarbons exceed only at some sites in vicinity of heavily trafficked road crossings.

The level of ozone is also increasing which is out come of inter action among hydrocarbons emitted from vehicles, nitrogen oxide and Sun rays. Both pollutants have adverse effects on human, environment and materials. An epidemiological study near Qartaba Chowk indicates that cases of allergy from dust are increasing due to air pollution.

The management of air pollution needs integrated approach, all the stakeholders are needed to be sensitized to play their role in pollution control. The laws are made for public and can only be implemented through participation of general public.

When sensitized vehicle drivers and other stake holders come to know the gravity of air pollution in their city where they breathe in and come to know their effects on them and their environment, it will prove an important tool in managing the problem on part of general public. Urban pollution is created by traffic and motor vehicles therefore, it is necessary that people may be aware of the situation.

Through this project the status of air quality with respect to Suspended Particulate Matter (SPM) Ozone, Temperature and Humidity will be displayed at three public places through LED screens.

## 2.4 OBJECTIVES OF THE PROJECT

Followings are the objectives of the project:-

1. Display of acquired data from automatic fixed and mobile monitoring stations to the general public.
2. Strengthening of air monitoring and testing capacity of EPA Lab on long term basis.
3. To sensitize the general public about state of air pollution.
4. Participation of general public in air pollution problem and create participatory and integrated approach for management of air pollution.

## 2.5 COST OF THE PROJECT

1. Total Planned Cost:
   - Capital Cost = Nil
   - Revenue Cost = Rs. 05.000 Million

   **TOTAL** **Rs. 05.000 Million**

2. Total Revised Cost:
   - Capital Cost = Nil
   - Revenue Cost = Rs. 06.600 Million

   **TOTAL** **Rs. 06.600 Million**
3. Total Actual Cost:
   - Capital Cost = Nil
   - Revenue Cost = Rs. 04.800 Million

   **TOTAL** **Rs. 04.800 Million**

**Detail of PC-I phasing/allocation, releases and expenditure are as under:-**

(Rs. In Millions)

| YEAR | ADP ALLOCATIONS | RELEASES | UTILIZATION |
|---|---|---|---|
| 2006-07 | 0.100 | 0.100 | 0.100 |
| 2007-08 | 4.900 | 3.667 | 3.667 |
| 2008-09 | 1.600 | 1.033 | 1.033 |
| **TOTAL** | **6.600** | **4.800** | **4.800** |

**Detail of Year wise break up for Capital and Revenue cost is as under:-**

| SN | COMPONENT | ADP PROVISION | AMOUNT RELEASED | AMOUNT UTILIZED |
|---|---|---|---|---|
| 1 | Transport | 0.075 | 0.075 | 0.075 |
| 2 | Land Rental | 1.800 | - | - |
| 3 | Equipment (Moving Display System) | 2.815 | 2.815 | 2.815 |
| 4 | Computers | 0.200 | 0.200 | 0.200 |
| 5 | Spares and Consumables | 0.300 | 0.300 | 0.300 |
| 6 | Utility Bills | 0.600 | 0.600 | 0.600 |
| 7 | Electricity Connections | 0.200 | 0.200 | 0.200 |
| 8 | POL and repair of motor cycles and equipments | 0.100 | 0.100 | 0.100 |
| 9 | Computer operator | 0.360 | 0.360 | 0.360 |
| 10 | Contingency | 0.150 | 0.150 | 0.150 |
| **TOTAL** | | **6.600** | **4.800** | **4.800** |

**Item wise and Year wise Financial Phasing, Allocation & Utilization of the Funds**

| SN | ITEM WISE PHASING AS PER LAST REVISION | ALLOCATED 2006-2007 (MILLION) | UTILIZED 2006-2007 (MILLION) | ALLOCATED 2007-2008 (MILLION) | UTILIZED 2007-2008 (MILLION) | ALLOCATED 2008-2009 (MILLION) | UTILIZED 2008-2009 (MILLION) |
|---|---|---|---|---|---|---|---|
| 1 | Transport (Logistics one motor bike Honda 125 cc) | 0.075 | 0.075 | - | - | - | - |
| 2 | Equipment (Moving Display Board) | - | - | 2.815 | 2.815 | - | - |
| 3 | Land Rental | - | | 1.233 | - | 0.567 | |
| 4 | Computer | - | | 0.200 | 0.200 | | |
| 5 | Spare and Consumables | 0.025 | 0.025 | 0.272 | 0.272 | 0.003 | 0.003 |
| 6 | Utility Bills | - | | - | - | 0.600 | 0.600 |
| 7 | Electricity connection by WAPDA and monthly electricity charges | - | | 0.100 | 0.100 | 0.100 | 0.100 |
| 8 | POL and repair of Motor Cycle and equipment | - | | 0.050 | 0.050 | 0.050 | 0.050 |
| 9 | Pay of computer Operator | - | | 0.180 | 0.180 | 0.180 | 0.180 |
| 10 | Contingency | - | | 0.050 | 0.050 | 0.100 | 0.100 |
| **TOTAL** | | **0.1** | **0.1** | **4.9** | **3.667** | **1.6** | **1.033** |

## 2.6 SPONSOR'S ASSESSMENT

Sponsor assessment report is the summary of project objectives, targets and provides comparison with achievements and status. It is the responsibility of sponsoring agency to provide this report. The gist of the Sponsor Assessment report is given under the heading of observation and recommendations.

# 3. METHODOLOGY

## 3.1 EVALUATION TYPE

The project's PC- IV was submitted on 13th January 2010 to P&D Department for evaluation so after the project closure "Terminal Evaluation" is being conducted.

## 3.2 PURPOSE OF EVALUATION

The purpose of this evaluation is to review the implementation process and achievements of results. It is helpful to map objectives and targets planned in PC-I with actual execution and implementation of project in order to assess whether it is successful.

## 3.3 EVALUATION PLAN

Evaluation plan process includes Team Formation, Literature Review, Visit to project location, Data Collection and Mapping of findings with PC-IV. The evaluation plan is devised to provide a roadmap for the project evaluation process.

## 3.4 TEAM FORMATION

A team was constituted to visit the project site for evaluation of the project having expertise in the project's domain i.e. Project Management, Information Technology, Data Collection Methods and Data Analysis & Interpretation.

## 3.5 LITERATURE REVIEW

The plan focuses on an initial literature review of all the relevant documents and other related stuff in order to have an understanding of the project. Following documents, websites and evaluation tools and techniques were consulted:

a. PC-I
b. PC-IV
c. Japan International cooperation Agency (JICA) questionnaire for data collection.
d. Program Assessment Reporting Tool (PART) developed by the U.S. Office of Management and Budget and Federal agencies.
e. DGM&E Evaluation Guidelines.

## 3.6 DATA COLLECTION

Following primary and secondary data collection tools were used for evaluation:

a. Visit to Project location.
b. Interviews and Q&A with project stakeholders.
c. Review of official records.

### 3.6.1 INTERVIEWS AND TELEPHONIC CONVERSATION

Interviews and telephonic conversation were held with the following officials of the project to get their view point.

| SN | Name of the Official | Designation |
|---|---|---|
| 1 | Dr. Shagufta Shah Jahan | DG, EPD |
| 2 | Mr. Farooq Alam | RO, Air Pollution |
| 3 | Mr. Nabeel | Data Entry Operator |

## 4. OBSERVATIONS

Evaluation of the project has revealed many facts about the project titled **"Installation of SPM Display Boards at three points in Lahore".** Gist of findings is given in ensuing paragraphs:-

1. The project has been completed within the planned budget (Rs. 06.600 M) with an actual cost of Rs. 04.800 M, covering the planned scope of the project.
2. The project has a time overrun of 11 months. It was initially approved for gestation period of 12 months from 1st July 2004 to 30th June 2005, while in its first revision it was extended for 24 months from 1st July 2007 to 30th June, 2009. However, the actual gestation period of the project is 37 months.
3. Only one project post of Computer Operator is involved in this project. At the time of evaluation, this post was vacant and the data entry / up-dation on the display boards were being managed by the resources acquired from another ongoing scheme.
4. The scope of the project has been completed and the data generated from the automatic air quality monitoring stations is displayed on the boards regularly. However, no substantial work has been undertaken to achieve one of the important objectives of the project which was the initiation of public participation, mass awareness through air quality management, traffic diversions, amelioration of air quality by reducing air born diseases caused due to polluted air.
5. Initially one monitoring station and one display screen was to be setup at Town Hall Lahore. Later in revision of the project, numbers of the display boards were increased to three.
6. These display boards are located at Town Hall, EPD Qaddafi Stadium, and Meteorological department Jail Road.
7. The monitoring equipment was excluded in the revision because JICA donated automatic air quality monitoring stations (two fixed and one mobile station). The data obtained through these monitoring stations are being displayed through three SPM display boards which were established under this project.

8. The display boards are working in good condition. However, no mechanism for the backup power supply in case of routine and emergency power failure is provided at any location.
9. The following table shows the data collected for 21th April, 2010 on twelve parameters (see description at Annexure- B) using the monitoring system along with the air quality chart suggesting the environment condition in Town Hall area Lahore. 61 value of air quality index showing that the unhealthy air in town hall area.

| Dated: 21th April, 2010 Daily Air Quality Report of Lahore (Town Hall Area) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NO | $NO_2$ | NOx | CO | $SO_2$ | $O_3$ | $PM_{2.5}$ | Wind Spd | Wind Dir | Temp | RH | Radiation |
| Start time | End time | µg/m3 | µg/m3 | µg/m3 | mg/m3 | µg/m3 | µg/m3 | µg/m3 | m/s | degrees | degC | % | W/m2 |
| 0:00 | 1:00 | 7.28 | 28.91 | 36.19 | 0.38 | 16.20 | 23.99 | 19.00 | 1.61 | 330.32 | 27.74 | 40.28 | 3.07 |
| 1:00 | 2:00 | 2.26 | 17.77 | 20.04 | 0.30 | 23.10 | 32.21 | | 1.41 | 330.74 | 26.42 | 44.44 | 2.80 |
| 2:00 | 3:00 | 2.55 | 15.60 | 18.15 | 0.19 | 18.90 | 45.46 | 69.00 | 1.72 | 338.81 | 25.99 | 45.16 | 2.81 |
| 3:00 | 4:00 | 2.01 | 17.65 | 19.66 | 0.20 | 27.36 | 31.14 | 69.00 | 2.22 | 304.47 | 25.57 | 46.59 | 2.88 |
| 6:00 | 7:00 | | | | | 24.71 | 38.43 | | 1.48 | 174.60 | 25.72 | 44.19 | 43.15 |
| 7:00 | 8:00 | | | | | 27.02 | 31.77 | 84.00 | 2.10 | 306.77 | 26.23 | 44.15 | 118.58 |
| 8:00 | 9:00 | | | | | 56.60 | 32.52 | 84.00 | 4.10 | 247.53 | 26.25 | 45.01 | 29.42 |
| 9:00 | 10:00 | | | | | 21.95 | 37.34 | | 2.83 | 312.89 | 25.23 | 52.48 | 335.14 |
| 10:00 | 11:00 | | | | | 17.34 | 47.20 | | 2.55 | 298.52 | 27.62 | 44.66 | 651.44 |
| 11:00 | 12:00 | | | | | 14.45 | 44.39 | | 2.27 | 285.84 | 28.64 | 42.12 | 119.74 |
| 12:00 | 13:00 | | | | 0.98 | 24.87 | 6.50 | | 1.63 | 164.78 | 24.32 | 60.91 | 52.89 |
| 13:00 | 14:00 | | | | | 18.65 | 66.23 | | 2.76 | 13.25 | 27.92 | 45.63 | 741.81 |
| 14:00 | 15:00 | | | | 0.36 | 14.05 | 61.07 | | 2.28 | 358.81 | 28.40 | 45.00 | 680.65 |
| 15:00 | 16:00 | | | | 0.67 | 11.04 | **74.23** | | 1.65 | 18.33 | 31.03 | 35.51 | 472.06 |
| 16:00 | 17:00 | 7.99 | 30.29 | 38.28 | 0.55 | 16.37 | 67.42 | 57.00 | 2.02 | 21.10 | 31.20 | 33.46 | 256.98 |
| 17:00 | 18:00 | 3.81 | 29.99 | 33.80 | 0.57 | 12.60 | 29.14 | 57.00 | 2.38 | 26.28 | 30.63 | 33.49 | 181.48 |
| 18:00 | 19:00 | | | | 0.89 | 17.37 | 40.01 | | 1.47 | 35.55 | 29.54 | 39.82 | 10.82 |
| 19:00 | 20:00 | 12.58 | 42.56 | 55.14 | 1.20 | 20.60 | 31.69 | 74.00 | 1.27 | 23.92 | 28.52 | 42.33 | 2.81 |
| 20:00 | 21:00 | 5.51 | 43.91 | 49.41 | 1.10 | 17.61 | 14.37 | 74.00 | 2.10 | 35.82 | 28.19 | 41.62 | 2.81 |
| 21:00 | 22:00 | | | | | 27.72 | 21.05 | | 1.53 | 40.32 | 27.22 | 42.01 | 2.57 |
| 22:00 | 23:00 | | | | 0.84 | 26.70 | 30.21 | 84.00 | 1.50 | 28.79 | 26.67 | 42.60 | 2.72 |
| 23:00 | 0:00 | | | | 0.73 | 26.60 | 26.37 | 89.33 | 1.56 | 27.63 | 26.07 | 43.12 | 2.71 |
| Average | | 5.50 | 28.34 | 33.83 | 0.64 | 21.90 | 37.85 | 69.12 | 2.02 | 169.32 | 27.51 | 43.39 | 169.06 |
| *NAAQS | | 40 for 24 Hrs | | 80 for 24 Hrs | 5 for 8 Hrs | 120 for 24Hrs | 180 for 1 Hr | 40 for 24 Hrs | | | | | |
| Air Quality Index (AQI) = (0.64/5) + (21.9/120) + (74.2/180)+(69.1/40)/4 x 100 = 61 | | | | | | | | | | | | | |

*NAAQS: National Ambient Air Quality Standard (Proposed) **61**

| AQI | 0 - 25 | 26 - 50 | 51-100 | 101 -200 | 201-300 |
|---|---|---|---|---|---|
| Air Quality | Clean | Moderate | Unhealthy | Severe | Hazardous |

10. The monitoring stations are connected to EPD through GPRS and data is collected from these stations regularly. Various time bound reports are generated using this data at EPD and the same data is displayed on the three display boards along with slogans/ recommendations in Urdu and English (see annexure – A). These display boards are connected to EPD via the PTCL land line data channel.
11. The placement of two display boards at Town Hall and Jail Road is not ideal. The board at Jail Road gets low attention due to traffic speed of passing by vehicles. The board at Town Hall is located at a point outside the comfortable vision zone of the road user while driving and the viewer has to divert his attention to look at the board which leaves the viewer with shorter time to read the information displayed.
12. Software for the data entry / up-dation on the display board was included in the procurement of these display boards.
13. The screen short of the software is as under:-

**Figure: 1**

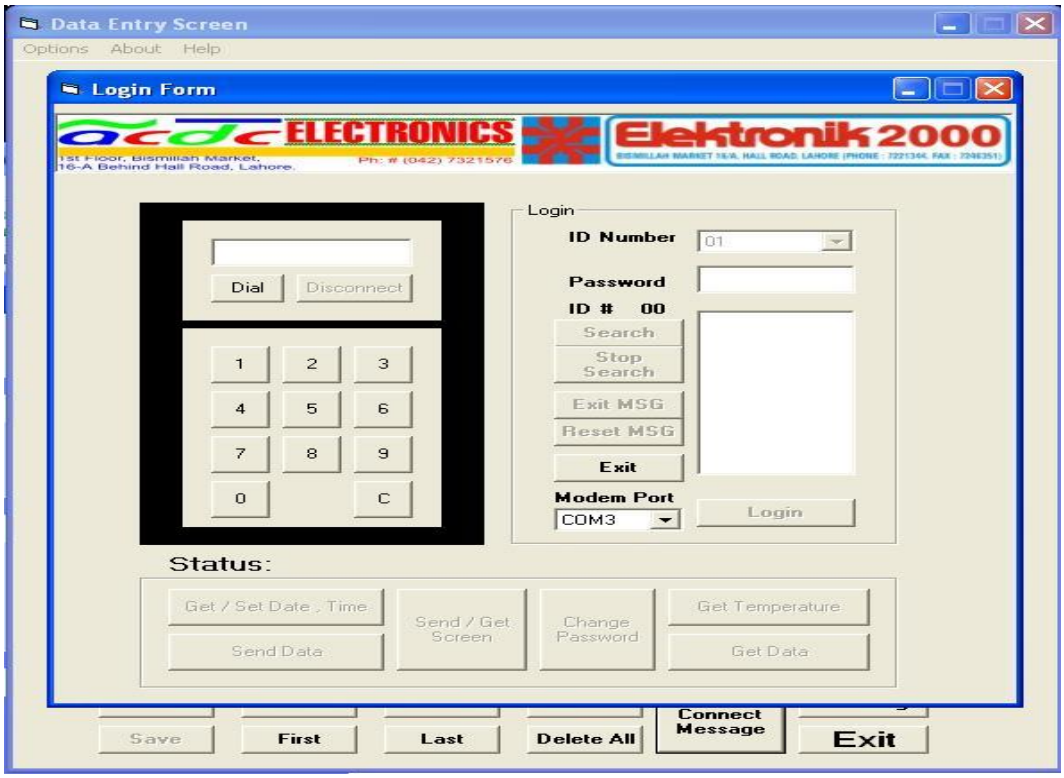



**Figure:2**


Data Entry Screen
Options About Help
ELECTRONICS
1st Floor, Bismillah Market,
16-A Behind Hall Road, Lahore.
Ph: # (042) 7321576
Elektronik 2000
Urdu/English RED Moving Message V3.10
Wednesday, April 28, 2010 8:15:42 AM
Message Type
Text
Calendar Clock
Temperature
Graphics
Animation
Speed
Speed1
Speed2
Lines
Single Line
Double Line
Language
English
Urdu
Color Scheme
Fonts
Forwards
موسم بہار میں زیادہ سے زیادہ پودے لگا ئیں۔
Start Function
Left to Centre
End Function
Centre to Right
Fonts_Urdu/English
Urdu1_Elektronik2000
Color_Scheme
Color Scheme 2
Add
Next
Previous
Delete
Connect Message
Total Msgs
Save
First
Last
Delete All
Exit

## 5. CONCLUSIONS

The scheme is very useful in sensitization of public about environmental issues especially urban air quality. The display boards may serve as forum where not only the data of air quality can be displayed but also different messages can be displayed on special environmental celebrations like environment days, earth days, water days, tree plantation days and independence days etc. At the same time suggestions to improve the air quality in city are also displayed which can be adopted by the citizens on their end.

After a detailed study and analysis of project documents, interviews and visits to project locations to determine project findings and provide feedback on the execution and implementation of the project it is concluded that the project is "**partially successful**".

# 6. RECOMMENDATION

The following recommendations were made after the analysis of the project:-

1. It is recommended that one project post of data entry operator (BS-12) may be transferred from development to non-development side.
2. In order to keep these display boards up and running twenty four hours the power back up system should be made available.
3. The environmental protection department should collaborate with city traffic police Lahore to control the traffic diversion from more polluted routes to less polluted routes.
4. The department should work on to educate the local people about the environment protection through advertisements /announcements on radio, TV and News papers, holding walks, seminars and workshops etc.
5. The location of the display boards preferably be at traffic signals or turns where the road users either stops for a while or slow down their speed so that they may have more time to read the message.
6. The display duration per message/information should be long enough so that majority of people could read it easily.
7. The type of display boards showing data related to number of parameters should be square instead of elongated rectangle so that maximum amount of information could be displayed in a single view.
8. The parameters displayed on the boards must be supplemented with its impact on environment and human life for understanding of common people such as in the below message displayed on the boards;

   **YESTERDAY'S AIR POLLUTION LEVELS AT GULBERG AREA:**

   - **CARBON MONO OXIDE 1.07mg/m3**
   - **OZONE 85.87ug/m3**
   - **NITROGEN OXIDE 50.51ug/m3**

   In the above message the effect of Nitrogen Oxide 50.5 ug/m3 may also be displayed.

## 9. LESSONS LEARNED

Following are the lessons learned from the project:-

I. Reliable data on environmental issues makes the planning process and execution more realistic in achieving the project objectives.
II. Proper identification of where we are and where we want to go increases the probability of success of the intervention.
III. Site selection is very critical to make an intervention successful.
IV. Government policy, instructions and guidelines should be kept in mind while framing the PC-1 and other documentation.

## ANNEXURE-A SLOGANS DISPLAYED ON DISPLAY BOARDS

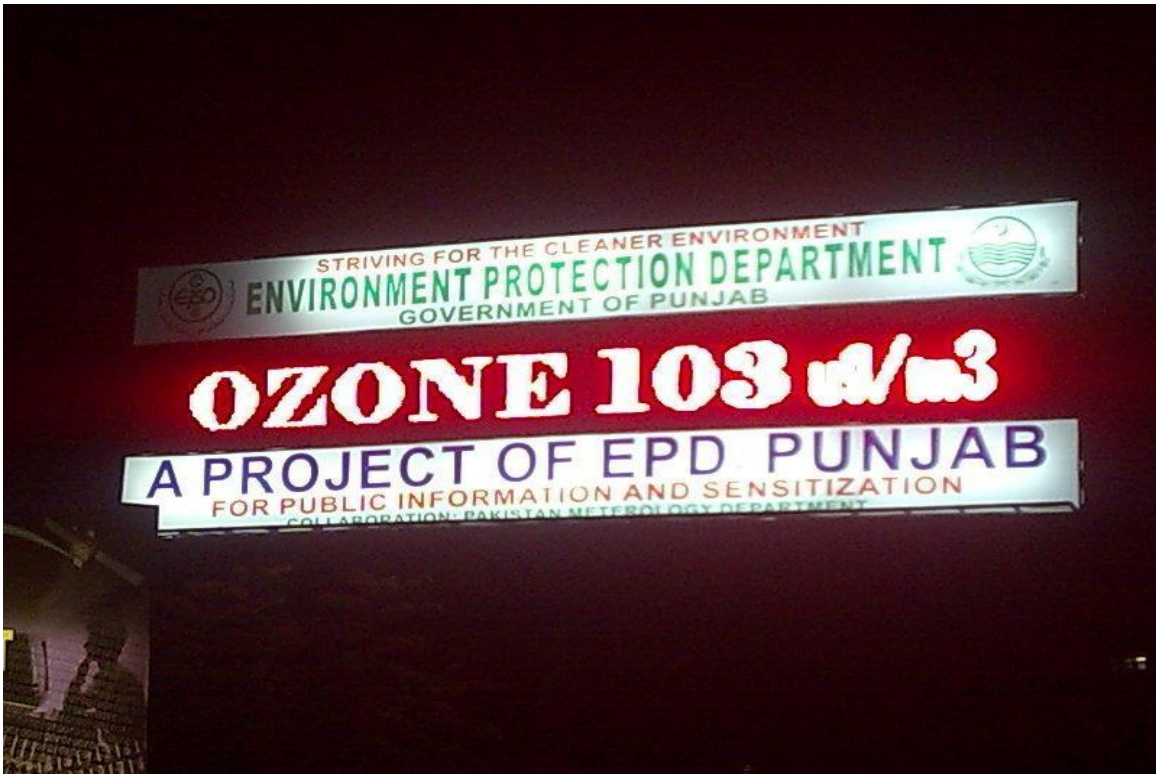
Following Slogans and simplified data are being displayed on the three display boards:-

- **YESTERDAY'S AIR POLLUTION LEVELS AT GULBERG AREA:**
  - **CARBON MONO OXIDE 1.07mg/m3**
  - **OZONE 85.87ug/m3**
  - **NITROGEN OXIDE 50.51ug/m3**
- **AIR QUALITY INDEX (STATUS) AT GULBERG AREA IS UNHEALTHY.**
- **SAVE NATURE FOR FUTURE GENERATION.**
- **THINK GLOBALLY ACT LOCALLY**
- **THE LESS YOU BURN, THE MORE YOU EARN**
- **MAKE TREES NOT STUMPS.**
- **POLLUTION, POLLUTION GREEN IS THE SOLUTION.**
- **ONE CAR, ONE FAMILY.**
- **SNOW IS MELTING, THE EARTH IS CRYING.**
- **AIR IS NOTHING BUT LIFE.**
- **EARTH ALLOWS YOU TO STAND; LET IT STAND THE WAY IT IS.**
- **EARTH DAY EVERY DAY**
- **EARTH ISN'T DISPOSABLE**
- **PROMOTE THE HABBIT OF SUSTAINABILITY BY ADOPTING THE BICYCLE RIDING.**
- **EDUCATION INSTITUTIONS CAN PROMOTE THE BICYCLE RIDING CULTURE IN THE CITY.**
- **BICYCLE RIDING HEALTHY, COST EFFECTIVE & ENVIRONMENTAL FRIENDLY HABBIT.**
- **AVOID USE OF PRESSURE HORNS**

## ANNEXURE-B DESCRIPTION OF THE PARAMETERS

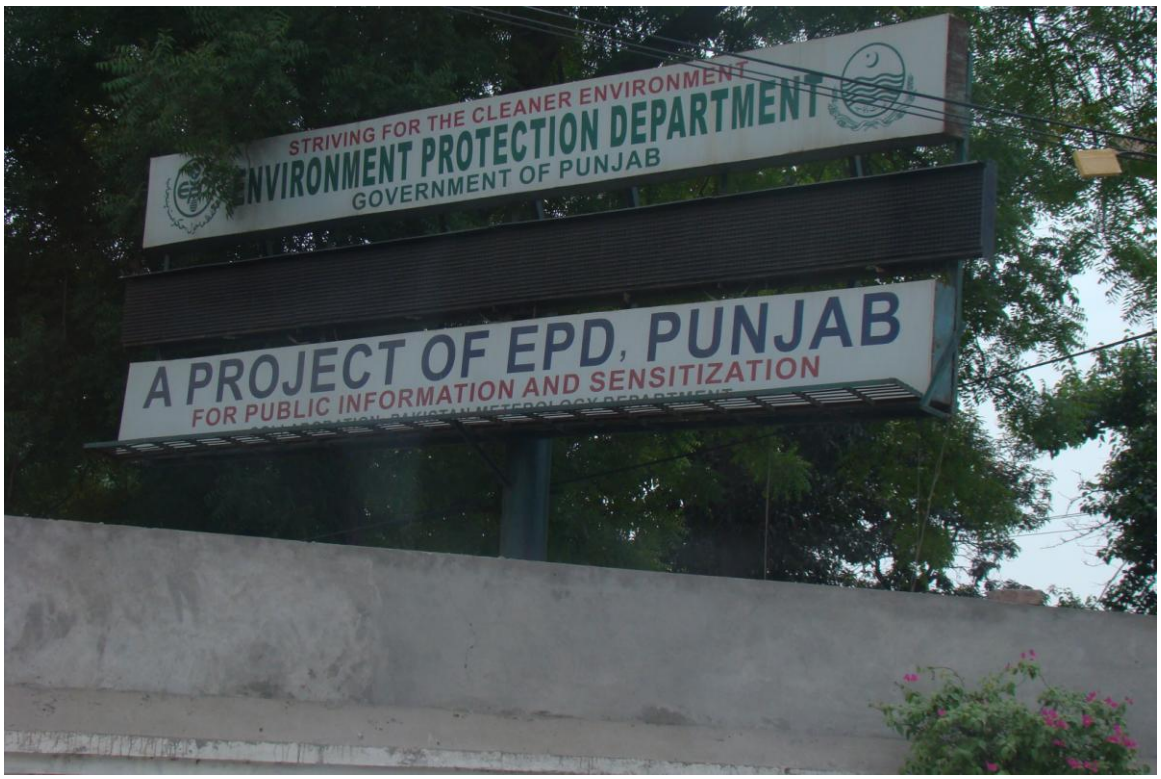
| SR. NO | PARAMETER | DESCRIPTION |
|---|---|---|
| 1 | NO | Nitrogen Oxide |
| 2 | $NO_2$ | Nitrogen Die Oxide |
| 3 | NOx | Sum of Both (NO and $NO_2$) |
| 4 | CO | Carbon Mono Oxide |
| 5 | $SO_2$ | Sulfur Die Oxide |
| 6 | $O_3$ | Ground Level of Ozone |
| 7 | $PM_{2.5}$ | Dust Level |
| 8 | Wnd Spd | Wind Speed |
| 9 | Wnd Dir | Wind Direction |
| 10 | Temp | Temperature |
| 11 | RH | Relative Humidity |
| 12 | Radiation | Sun Light Radiation |

## ANNEXURE-C PICTORIAL




**Display Board**


**Mobile Monitoring Station**




**Display Board at Jail Road. Lahore**


**Display Board At Town Hall Mall road. Lahore**