Improving air quality monitoring systems in Asia

Kaye Patdu
Clean Air Asia

Expert Group Meeting on Strategies for Improving Environment Statistics in Asia and the Pacific

4 December 2013
Bangkok, Thailand

About Clean Air Asia

Mission: to promote better air quality and livable cities by translating knowledge to policies and actions that reduce air pollution and greenhouse gas emissions from transport, energy and other sectors.

Clean Air Asia was established by the Asian Development Bank, World Bank and USAID in 2001. Since 2007, Clean Air Asia consists of

- the Clean Air Asia Center as an independent NGO
- a UN recognized partnership of more than 240 organizations in Asia and worldwide
Use of Air Quality Data
1- Standards setting and review: Hong Kong

1. 1990 – Enforcement of AP Control (Fuel Restriction) Regulations. Prohibits use of high sulfur content solid and liquid fuel for commercial and industrial appliances
2. 1995 – Reduce sulfur content of motor diesel fuel to 0.2%
3. 1997 – More stringent control on new power plants
4. 2001 – Reduce sulfur content of motor diesel fuel to 0.035%
5. 2002 – Motor diesel fuel tightened to Euro IV standard (i.e. “ultra low sulfur diesel”), caps sulfur content at 0.005%
6. 2005 – Total emission control imposed on all power plants

Use of Air Quality Data
2- Air quality progress monitoring: Delhi

Annual SO2 standard has been met for almost 2 decades but no change yet in standard.

Use of Air Quality Data
3- Public communication: Hong Kong and Shanghai

Use of Air Quality Data
3- Public communication: clean air = clean air?
**Air Quality**

**Data availability**

- **Pollutants**: PM$_{10}$, SO$_{2}$, NO$_{2}$ (PM$_{2.5}$ for few cities)
- **Geographic scope**: 22 Asian countries (over 400 cities)
- **Frequency**: annual average ambient air concentrations from 1993 to 2011
- **Source**: Secondary data from environment bureau website, national statistics websites, request from city contacts

Source: [www.CitiesACT.org](http://www.CitiesACT.org), Clean Air Asia, 2013
About the Project
AQ Interventions: Improving AQ monitoring systems in Asian cities

- **Objective**: identify cities that have achieved significant improvement in AQ and enhance opportunities for south-south learning by twinning.

- **Intended outcome**: identify interventions to improve AQ data and enhance technical collaboration among Asian cities by developing improved understanding of current status, quality and best practices in air quality monitoring.

- **Duration**: May 2012 – February 2013

Air Quality Monitoring Assessment

**AQ Monitoring Survey Respondents**

- **39 valid city respondents, covering 14 countries** (Bangladesh, Bhutan, China, India, Indonesia, Japan, Lao PDR, Mongolia, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, Vietnam)

- **11 megacities** including Tokyo, Jakarta, Seoul, Delhi, Mumbai, Manila, and Dhaka.

**In-depth assessment**

- Thailand – Bangkok, Rayong; Vietnam – Hanoi and HCMC; Singapore; Mongolia – Ulaanbaatar; Republic of Korea – Seoul; Indonesia – Bandung, Jakarta, Surabaya; India – Delhi; Hong Kong; Philippines – Metro Manila
Air Quality Monitoring Assessment
City Assessments - Findings

Technical Challenges
- Limited scope: cities, pollutants, stations
- Equipment and site selection, maintenance and management
- Synergies of Manual and Continuous monitoring systems
- Quality Assurance and Quality Control
- Power fluctuation and outages; security

Sustainability and Financing
- Budget Allotment for AQ Monitoring Systems: Capital investment and budget for operations
- Sustainable Management-National vs City Air Quality Monitoring Systems
- Alternative Financing options for AQ monitoring

Capacity Development
- Regional/National Training Centers on Air Quality Monitoring
- Roles of University and Research Institutes on AQ Monitoring and Management
- Disseminating Air Quality Monitoring Results to Stakeholders
- City Twinning

Use of data
- Lack of linkages with standards review, revisions
- Data management, analysis and reporting

Presented at the Better Air Quality Conference December 2012

Good Practice Guidance on Air Quality Monitoring Systems in Asian Cities

- Describes essential characteristics of a good monitoring system, including examples of international guidelines.
  1. Ability to properly plan and implement a AQM network to a compatible international standard
  2. Ability to plan and implement a QA/QC process
  3. Ability to disseminate AQM data and analytical results to stakeholders
  4. Ability to utilize the AQM results to improve AQ control policy
  5. Ability to provide manpower and financial resources to sustain the AQM system

- Compare against these guidelines and identifies challenges in meeting them.
- Good practices of selected cities
Online database

CitiesACT

Discover data and indicators; analyze data trends; and visualize and download data and statistics.

Policy support

- **Improving AQM:** Fourth Government Meeting on Urban Air Quality in Asia endorsed the development of the **Guidance Framework on Urban Air Quality in Asia**
  - Ambient air quality standards and monitoring systems
  - Emissions inventories
  - Health and other impacts
  - Clean air plans, policies and measures
  - Communicating on air quality, health and co-benefits
  - Supporting Governments in improving urban AQM

[http://cleanairinitiative.org/portal/node/11631](http://cleanairinitiative.org/portal/node/11631)
Next Steps

- Explore a model of establishing a regional center which leases AQ monitoring equipment to member cities and provides technical support to these cities.
- This would allow cities with limited resources to still measure the air quality situation in their area. AQ monitoring equipment providers may be approached to lend out their products to the center for an agreed period of time.

Example: BAGA “Lungs”

- Cebu City, Philippines
- Before 1993: Cebu City’s hospitals had no pulmonary units, not enough ventilators to go around, not even a single pulse oximeter
- 1991: 12 Adult Pulmonologist, 2 Pediatric Pulmonologists, and 1 Thoracic surgeon came together to form BAGA (Lungs): “Breathe Always Good Air”.
- The team acquired various medical equipments: pulmonary machines and x-ray machines. They also develop hospital and non-hospital based pulmonary centers, scholarship programs and libraries.
- As of 2007, BAGA has 21 members and affiliate members.
- 2013: BAGA is engaged in the business of leasing pulmonary equipment and services, and offers to lease the aforesaid pulmonary units to hospitals. BAGA now has a 24 hours Hotline to give excellent service and support to the Doctors and Patients. BAGA provide its own Respiratory Therapist to insure proper handling of the machines and Technicians to ensure that all machines are working properly.
• **Metro Weather** is a public-private partnership that has established a network of 30 automated weather stations (AWS) in Metro Manila.

• Provide free and near real-time weather data that can be used to prepare for severe weather conditions such as tropical cyclones and heavy flooding.

• **Project partners** are the Metro Manila Development Authority, Chevron, the Manila Observatory, Globe Telecom, and Ateneo de Manila University.

• **ROLES:**
  - Chevron provide both financial resources as well as technical and infrastructure support through select Caltex service stations in strategic locations.
  - Manila Observatory conceptualized the establishment of a dense, urban network of AWS. MO provides the scientific and technical support in the installation, operation and maintenance of the AWS network.
  - Globe Telecom seeks partnerships that support its advocacy of environmental sustainability and provides ICT infrastructure.
  - MMDA assisted in selection of appropriate locations for the AWS, will support MO in providing information which will aid the development and implementation of an evidenced-based decision support system for urban risk reduction, and assist in the physical maintenance of the AWS.
  - Ateneo assists in creating relevant academic and research entry points for the analysis and communication of the AWS data.

---

For more information: www.cleanairasia.org