Filling the data gaps for air quality management

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The current state of the air

- Ambient air pollution is a leading cause of sickness and death worldwide – ranked in the top 10 health risk factors in the Global Burden of Disease (Lancet, 2015)
- Most of those deaths occur in developing countries and result in a heavy economic burden (>3% of GDP in some countries)
- Other impacts: visibility, ecosystems
- Air pollution is constituted of a complex mixture of gases and particles.
- Particles smaller than 2.5 micrometers – or PM$_{2.5}$ – are a primary pollutant of concern in many countries due to wide-ranging health effects and formation from many sources

Satellite image showing average PM$_{2.5}$ levels from 2001-2006. Reference: van Donkelaar et al, 2010.
Measuring the air in low and middle income countries

- Measurement of air pollution is critical to support successful air quality management.
- Air monitoring practices worldwide range widely:
  - Prevalence: No air monitoring at all to mature networks.
  - Quality: Inconsistent training, equipment management, and quality assurance to rigorous air quality monitoring.
  - Data availability: If measured, limited data availability to real-time updates to accessible databases.
  - Support: Low priority to mission critical.

"If you cannot measure it, you cannot improve it..“ - Lord Kelvin

“Nigeria's Port Harcourt covered in mystery cloud of soot”

BBC News
4 March 2017

Measuring the air in low and middle income countries

Significant air quality data gaps in many countries
Source: waqi.info
Measuring the air

- Meanwhile, a growing diversity of measurement technologies has emerged:
  - Small air sensor technology – stationary networks, portable monitors
  - Mobile monitoring platforms
  - Satellite remote sensing data

- Can these technologies help improve knowledge of air quality conditions and support air quality management? How accurate / reliable / suitable are they?

References: AQMesh (top left photo), NASA (top right), EPA (bottom photos)
Filling the Gaps Workshop

- World Bank and US EPA co-hosted a workshop in July 2017 to discuss the state of air monitoring and new technologies
  - 2 ½ day event in Washington, DC
  - Approximately 50 invitees, including representatives from government institutions, private sector, multilateral organizations, academia

- Presentations were given on:
  - Country and international organization perspectives
  - Technical experts – ground-level monitoring, satellite remote sensing, quality assurance, data management
  - Highlights of innovative projects

White Paper/Discussion Draft

- Provides framework to consider the spectrum of air quality technologies and recommendations for countries at different phases of AQ monitoring.

- Structure:
  - Chapter 1: Problem Statement and Overview
  - Chapter 2: Factors Influencing Air Quality Monitoring in Low and Middle Income Countries
  - Chapter 3: Technical Steps and Future Research Needs to Meet LMIC goals
  - Chapter 4: Sustainable and Successful Monitoring: The Human and Institutional Dimension
  - Chapter 5: Recommendations

- Needs review and input from user community

Filling the Gaps Workshop

Some key messages in the report:

- Measurement strategies must be selected to fit a purpose, and should be linked to air quality management goals.
- A successful, sustainable monitoring strategy requires more than equipment.
- The purchase price of monitoring equipment is not the full cost.
- Quality assurance planning, including data management, is one of the most critical components of an air measurement strategy.
Thank you!

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