Integrated Programme for Better Air Quality in Asia (IBAQ Programme)

CITY SOLUTIONS TOOLKIT:

STAKEHOLDER MOBILIZATION FOR AIR QUALITY MONITORING

THE SITUATION

Successfully improving a city's air quality is not the sole responsibility of the government. The participation of all stakeholders (i.e. all groups and entities in the community) in the air quality management (AQM) system is paramount. This process is concretely demonstrated in the participatory process of developing a Clean Air Action Plan (CAAP). The CAAP development process is indispensable in establishing a good AQM system where scientific information on the levels of air pollution, emission sources as well local health and environmental impacts of pollution are used to provide a comprehensive understanding of the air quality status in the city. This understanding of air quality status becomes the basis for how the government and various stakeholders prioritize actions in the CAAP and mobilize resources in the most effective and efficient manner to reduce emissions, protect human health and the environment, and help achieve air quality objectives (Clean Air Asia, 2019). For detailed guidance on clean air action planning, see module on Step-by-step guide for cities to develop clean air action plans. Aside from being a scientific and systematic way of identifying resource-efficient measures, clean air action planning also ensures that core principles crucial to a good environmental governance system are in place.

The first step in managing the air pollution problem is identifying its extent through systematic measurements or monitoring (Clean Air Asia and UN Environment, 2019a). Air quality monitoring is sometimes seen as an activity that is limited to governments, while stakeholders wait for publicly available data. The collection of air quality data is considered as a technical process, and access is limited to those with advanced technical background on measurement technologies. While this is true on most aspects, this should not hinder stakeholders from participating in air quality monitoring activities.

Understanding possible ways of stakeholder participation is important to ensure public support, not only in the data collection processes, but also in the implementation of pollution control measures. Ensuring a participatory process gives stakeholders a sense of ownership for the city's activities and actions. In most cases, this can lead to more sustained efforts that are needed to continuously improve air quality in the city. After all, every individual and group will gain environmental, health, and economic benefits from air quality improvements.

In this module, the following will be covered:

- Basic understanding of the air quality monitoring process
- Discussion of innovative approaches related to data generation and use

- Identification of various stakeholder groups that can be mobilized for air quality monitoring
- Prescribed roles of stakeholders in air quality monitoring

AIR QUALITY MONITORING: DATA COLLECTION AND USE

Several modules, as part of this Toolkit, provide comprehensive guidance on air quality monitoring. These modules are itemized and linked below, together with important takeaways that are necessary for engaging stakeholders:

(1) A Guide to Designing Ambient Air Quality Monitoring Systems: Siting and Number of Monitors

The planning stage of designing an ambient air quality monitoring system for the city is crucial for stakeholder participation. During this stage, it is important that the needs and concerns of the public are raised. This will inform the planning and decision making of the government bodies involved in the process and ensure that local context is considered. For instance, in deciding where to site an air quality monitoring station, locals/residents can provide detailed insights on the conditions and activities in the area (e.g. proposed site is where mobile food stalls park during weekends, proposed site is where the vulnerable population resides). This can help assess the suitability of the site for monitoring or if there are supplementary activities/data collection that must be done.

Aside from providing input on siting and other decisions, stakeholders such as private individuals, companies or institutions can participate by 'hosting' an air quality monitor in their vicinity. While the role is usually taken on by government agencies, this can be an alternate arrangement. This is applicable when the location of interest is owned or managed by these stakeholders and/or when the latter is willing to contribute resources to the monitoring (e.g. by securing electricity and ensuring safety of the instrument/s).

(2) Operation and Maintenance of Air Quality Monitoring Stations and Quality assurance/quality control of air quality monitoring data

The operation and maintenance of air quality monitoring instruments are conducted by technical experts and air quality managers. Given the technical background of academic institutions, private companies and civil groups, these stakeholders can provide expert assistance and suggestions to the government in terms of techniques or provision of consumables (e.g. filters, spare parts) and other materials.

The general public can also exercise their right to information by demanding for air quality data and in some cases, for transparency on the status of air quality monitoring stations. This aims to influence policy and decision makers to formulate and implement sound and robust AQM programs.

(3) <u>Air quality data analysis and utilization for different objectives</u>

While the analysis of air pollution data is mainly done by technical staff and air quality managers, academic experts can support and provide advice. Aside from environmental or atmospheric experts, statisticians can also play a role in this aspect. Other stakeholders, on the other hand, can be engaged in the use of the data on the following:

- **Raising awareness**: Traditional (TV, radio, newsprint) and non-traditional/social media news outlets play a crucial role in disseminating information generated from AQ monitoring (see module on <u>Engaging the media in air quality communication</u> for more details). Educational institutions must also be closely involved. With everyone's access to social media outlets, all stakeholders can participate by sharing air quality-related information online.

- **Compliance monitoring**: Most countries have National Air Quality Guideline Values and other air quality standards that are reflected in national laws and ordinances. The actual compliance check would therefore be the main responsibility of the government, but all stakeholders are enjoined to monitor if the city is below or above the standards. For the general public, the most accessible data is the Air Quality Index (AQI) that is usually reported by the government through websites and mobile apps. AQI relates the pollution levels in easy to understand indices related to health (Good, Moderate, Unhealthy, Very Unhealthy, Hazardous). In most cases, Unhealthy AQI can also mean non-compliance to standards aside from the health risks posed by air quality at that level. It is thus important that stakeholders exert effort in being regularly updated with the latest information provided by the government, and in actively expressing concern if the AQI not ideal or if the level of pollution exceeds standards. As mentioned, knowledge of the public's engagement can help motivate the government to ensure compliance.

  It is also important to note that continuous exceedance of the standards may lead to the designation of the location as a "non-attainment area." In some governments, under law, this can mean that strict measures may be put in place in order to meet air quality standards. Examples of such strict measures would be prohibition of certain types of vehicles or shutdown of major emission sources. In this case, stakeholder groups belonging to business, tourism, transport, and private sectors are affected. It is thus encouraged that stakeholders are constantly involved and updated with compliance monitoring.

- **Health Impacts Assessment (HIA)**: In AQM, a Health Impacts Assessment (HIA) is a process of assessing to what extent an event, scenario, intervention, or control measure related to air pollution affects health. As described in the HIA modules (see <u>Stages and types of health impacts assessment for cities</u> and <u>Health impacts assessment tools for</u>

cities), medical/public health experts and health groups play an important role in the generation and use of air quality data. Stakeholder roles in the conduct of HIA can include sharing or facilitating access to existing data, collecting additional data needed or performing data analysis or modeling. Detailed information on these roles can be found in the Inter-agency collaboration for health impacts assessment module. Moreover, since public health is a concern of all stakeholders, everyone is encouraged to participate in surveys where supplemental data is required to conduct HIAs (i.e. provision of health history, willingness-to-pay, incurred health costs, etc.).

- **Planning:** As previously mentioned, CAAP development enables stakeholders to come together, use data to understand the status of air quality and their city, and identify measures to reduce emissions, protect human health, and achieve air quality objectives. For use of air quality monitoring data and the role of stakeholders in for Clean Air Action Planning, please see the module on Step-by-step guide for cities to develop clean air action plans .

(4) Technology options for air quality monitoring: Conventional vs. Next-generation

Conventional monitoring involves the use of sophisticated, top-quality standard instruments by technical experts. Non-reference or 'next-generation' sensors offer an alternative opportunity for public participation in air quality monitoring, which is called 'Citizen Science'. This is a low-cost approach to collect data, increase air pollution awareness, engage stakeholders, and foster attitudinal and behavioral change (Clean Air Asia and UN Environment, 2019b).

The wide range of options for low-cost air quality sensors in the market, with price points as low as 100 USD, enables individuals to purchase the technology for personal use to become more aware and engaged in pollution reduction efforts. In most cases, data from sensors are automatically consolidated in the Cloud and analyzed to show spatial pollution maps. Each stakeholder is thus contributing to the generation of data. However, caution must be taken since the quality of data of these low-cost sensors are not the same as reference instruments. Improper interpretation of data could lead to confusion, hence must be guided by AQM practitioners or technical experts.

STAKEHOLDERS AND THEIR ROLES IN AQ MONITORING

The table below summarizes the main stakeholder groups that can be involved in the process of air quality monitoring within a strategic AQM framework. Since the development and implementation of solutions to air pollution is a collective effort from various professions, organizations, and agencies, defined roles can facilitate a fruitful engagement and partnership building. The end goal is to establish a reliable collection and maintenance of data for sound decision making.

Institution	Main roles and responsibilities
National government	• Develop and implement the national air quality monitoring plan • Procure, operate, and maintain reference air quality monitoring stations
Local government	• Develop and implement the local air quality monitoring plan • Procure, operate, and maintain additional air quality monitoring equipment • Convene stakeholders for input on the air quality monitoring process
Academia	• Provide assistance in the set-up and siting of air quality monitoring equipment (e.g. host instruments in their compound etc.) • Support the local government in establishing air quality monitoring-related protocols that are scientifically valid and internationally accepted • Support technical capacity building of the local government or air quality managers handling air quality monitoring • Augment capacity of government in analyzing samples (if filter air sampling is done) by performing chemical analyses in their laboratory
Private sector	• Provide assistance in the set-up and siting of air quality monitoring equipment (e.g. host instruments in their compound etc.) • Assist in funding technical workshops that would build capacity of government of air quality monitoring (data collection and analyses) • Procure ambient air quality monitoring instruments or sensors and share the data collected to air quality managers and experts (before sharing to the public) • For point sources, share air quality data collected from their stack tests of continuous emissions monitoring systems (CEMS) in a timely manner
Non-governmental organizations and foundations	• Monitor the implementation of the air quality monitoring plan • Coordinate with national or local government in hiring local consultants and technical experts to support air quality monitoring efforts • Assist in funding technical workshops that would build capacity of government of air quality monitoring (data collection and analyses) • Contribute to responsible data gathering and online data sharing
Mass media	• Effectively communicate air quality data and related information to the public
Civil society, sectoral groups and private citizens	• Participate in group discussions and stakeholder consultations related to air quality monitoring and the use of data collected • Contribute to responsible data gathering and online data sharing

REFERENCES:

Clean Air Asia and UN Environment. (2019a). Training module on the Guidance Framework for Better Air Quality in Asian Cities: Guidance Area 1. Ambient Air Quality Standards and Monitoring. Unpublished

Clean Air Asia and UN Environment. (2019b). Training modules on the Guidance Framework for Better Air Quality in Asian Cities: Guidance Area 4. Air Quality Communication. Unpublished