GUIDANCE FRAMEWORK
FOR BETTER AIR QUALITY IN ASIAN CITIES

Guidance Area 6: Governance

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ABOUT CLEAN AIR ASIA
www.cleanairasia.org

Clean Air Asia is an international NGO established in 2001 as the premier air quality network for Asia by the Asian Development Bank, World Bank and USAID. Its mission is 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 became a UN-recognized partnership in 2007, its network spanning 250 organizations in 31 countries in Asia and worldwide, with 8 country networks: China, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka and Vietnam. It is headquartered in Manila and has offices in Beijing and Delhi. Clean Air Asia leads efforts to enable Asia's more than 1000 cities to reduce both air pollution and CO_2 emissions, and thereby contribute to more livable and healthy cities with blue skies and low carbon footprint. Clean Air Asia helps to reduce emissions through policies, plans, programs, and concrete measures that cover air quality, transport and industrial emissions and energy use.

The Better Air Quality (BAQ) Conference is a flagship event of Clean Air Asia covering the key sectors of transport, energy and industry, with a particular emphasis on government policies and measures. Policy makers, practitioners and industry leaders meet at BAQ to network, innovate, learn and share experiences. The biennial event was first held in 2002 and attracts close to a thousand participants from Asia and the rest of the world.

Disclaimer

Contact

Clean Air Asia Center
Unit 3505 Robinsons Equitable Tower
ADB Avenue, Pasig City, 1605
Philippines
Tel +632 6311042
Fax +63 2 6311390
center@cleanairasia.org

Clean Air Asia India Office
1st Floor, Building No.4
Thyagraj Nagar Market Lodhi Colony
110003, India
Tel +91 11 60120260
Fax +91 11 43850032
india@cleanairasia.org

Clean Air Asia China Office
11152, JianGuoMenWai
Diplomatic Residence
Compound, No.1 XiuShui Street,
ChaoYang District, Beijing,
China, 100600
Tel/Fax:+86 10 8532 6972
china@cleanairasia.org

Country Networks in China, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Vietnam

CONTENTS

PREFACE

Air pollution is now considered the world's largest environmental health risk. There have been a number of global efforts calling for air pollution actions in recent years. These global calls for action on air pollution strengthen regional and national initiatives and highlight the need to prioritize addressing this issue through a collaborative and integrated approach.

In 2006, the First Governmental Meeting on Urban Air Quality in Asia[1] recognized the need for guidance in implementing a Long Term Vision for Urban Air Quality in Asia, which describes the desired state of urban air quality management in Asian cities. During the Third Governmental Meeting, environment ministries from the region identified key challenges they are facing to improve urban air quality.

To set the way forward in achieving the vision for cleaner air, Clean Air Asia led the development of the Guidance Framework for Better Air Quality in Asian Cities (Guidance Framework) to address the needs and challenges in the region. It aims to provide a recognized guidance on improving urban air quality and is organized around priority areas of concern in the region, which were translated into key guidance areas with roadmaps on how to progress in a step by step manner.

This voluntary, non-binding document consists of seven individually published chapters covering each of the Guidance Areas. Policy and decision makers in Asia, as well as other relevant stakeholders, can use one or a combination of the Guidance Framework chapters to develop local roadmaps or action plans depending on their priority areas of concern.

The Guidance Framework consists of seven main books with these titles:

- Introduction
- Guidance Area 1 - Ambient air quality standards and monitoring
- Guidance Area 2 - Emissions inventories and modeling
- Guidance Area 3 - Health and other impacts
- Guidance Area 4 - Air quality communication
- Guidance Area 5 - Clean air action plans
- Guidance Area 6 - Governance

These guidance areas come with an Information Sourcebook, which is a compilation of resources to support the implementation of Guidance Framework roadmaps. There is also an accompanying training course on Guidance Framework implementation, which is available online in the Clean Air Asia website and Integrated Programme for Better Air Quality (IBAQ Programme) website: www.cleanairasia.org/ibaq

The Guidance Framework was developed together with a team of international and regional experts and practitioners and has undergone an extensive review process through the Governmental Meetings and the involvement of external reviewers. The draft document was also shared in a number of international events, including the Asia Pacific Clean Air Partnership (APCAP) Joint Forum organized by UNEP ROAP in November 2015. The Guidance Framework was welcomed by participants from 24 countries in Asia and the Pacific, involving environment ministries, intergovernmental organizations, non-governmental organizations, and experts.

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1   Governmental Meetings on Urban Air Quality in Asia are biennial meetings organized by the United Nations Environment Programme Regional Office of Asia and the Pacific (UNEP ROAP) and Clean Air Asia that convene environment ministries with the aim to harmonize approaches across the region in tackling air pollution and related fields.

ABBREVIATIONS

ADB	Asian Development Bank
AQI	Air Quality Index
AQM	Air Quality Management
CAC	Command and Control
CO	Carbon monoxide
EEA	European Environment Agency
EPDC	Electric Power Development Co., Ltd
ERP	Electronic Road Pricing
EU	European Union
ICLEI	International Council for Local Environmental Initiatives
IGES	Institute for Global Environmental Strategies
MBI	Market-Based Instruments
O_3	Ozone
OECD	Organisation for Economic Co-operation and Development
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter (≤ 2.5 micrometers in diameter)
PRD	Pearl River Delta
SEI	Stockholm Environment Institute
SO_2	Sulfur dioxide
UNEP	United Nations Environment Programme
USEPA	United States Environmental Protection Agency
YRD	Yangtze River Delta

CHAPTER 7

GUIDANCE AREA 6: GOVERNANCE

7.1 Introduction

Environmental governance encompasses the rules, practices, policies and institutions that define stakeholder's interaction with the environment as well as outlining their role in environmental impact (United Nations Environment Programme [UNEP], 2009). Air quality governance, in particular, can spell the difference between clean air and polluted skies. Discussions over governance, however, can be rather abstract and disengaging. Decision-makers are often not involved in the day-to-day rigors of air quality management (AQM). The challenge is to provide decision-makers who work on "big picture policy" as well as those engaged in "on-the-ground implementation" a common language to identify the appropriate forms of governance for their city. This chapter aims to achieve this goal.

The chapter begins by presenting regulatory instruments employed independently and in combination to manage air quality; then discusses how these instruments are embedded in different governance arrangements. It is understood that there is unlikely to be a universal approach for different contexts in Asia, hence the instruments and arrangements will vary across countries and cities. Instead, this guidance area illustrates how core governance principles can help make the policy instruments and governance arrangements actionable in many settings. The chapter then presents various stages of air quality governance and a roadmap that can help policymakers move forward until they reach the fully developed stage, where various challenges would have been addressed to harness the energies and insights of more stakeholders at different levels.

7.1.1 Objective

To provide good governance approaches that facilitates effective policy development and implementation, supporting information-sharing and accountability mechanisms, and strengthening stakeholder participation in all aspects of AQM.

7.1.2 Policy instruments

There are several policies, measures and instruments available to policy and decision-makers to manage urban air quality. A summary of types of policy instruments is provided in Table 7.1

Table 7.1 Types of environmental regulation

Type	Description	Example
Command and control (CAC)	Issue of licenses, setting of standards, checking for compliance with standards, sanctions for non-compliance	Air pollution control regulations Government monitoring Emission standards Enforcement policies
Economic instruments	Use of pricing, subsidies, taxes, and charges to alter production and consumption patterns of organizations and the public	Load-based emission charges Tradeable emission permits Differential taxes True cost pricing of resources
Co-regulation and voluntary initiatives	Formulation and adoption of rules, regulations and guidelines in consultation with stakeholders, negotiated within prescribed boundaries Voluntary adoption of environmental management measures	National registers of pollution emission inventories Environmental management systems
Self-regulation	Self-imposition of regulations and guidelines and environmental audits by industry groups	Industry codes of practice Self-audit within industry groups Emission reduction targets

Source: Stokholm Environment Institute (SEI), 2008

To provide **good governance** approaches facilitating **effective policy development** and implementation, **supporting information-sharing** and accountability mechanisms, and **strengthening stakeholder participation** in all aspects of **air quality management.**

The CAC instruments serve as the foundation of most countries' air pollution regulations. CAC regulations "prescribe how much pollution an individual source or plant is allowed to emit and/or what types of control equipment it must use to meet such requirements" (United States Environmental Protection Agency [USEPA], 2014; Blackman & Harrington, 2000). Compliance with CAC instruments is secured through permitting, monitoring, inspection and enforcement; and penalties or other forms of administrative sanctions that are often levied if a facility or emission source fails to meet standards. It can be difficult, however, to tailor CAC instruments to different sources and they tend to offer fewer opportunities for cost-effective innovation (USEPA, 2014).

Economic or market-based instruments (MBIs) address this difficulty by putting a price on pollution directly through emission fees, taxes and environmental subsidies or indirectly through emissions trading schemes (Blackman & Harrington, 2000). The price on pollution encourages sources to identify more cost-effective solutions or purchase credits from sources with lower abatement costs. A congestion charge or toll tax, emission and/or pollution tax or charge, fuel tax, and vehicle tax are examples of

MBIs in the transportation sector (Timilsina & Dulal, 2008). Singapore's experience in utilizing MBIs to address the growth of vehicles is summarized in Box 7.1. Stakeholder engagement, transparency, infrastructure and technology are significant factors contributing to Singapore's success controlling vehicle numbers through MBIs.

Voluntary regulations that encourage, but not prescribe, controls that should be taken are often backed up with indications of mandatory reductions following inaction. Voluntary regulations can use the implied threat of government-led action to encourage companies to identify their own cost-effective approaches to pollution controls (USEPA, 2014). Examples of voluntary regulations are the pollution control agreements used in Japan. Voluntary agreements (or pollution control agreements) are ways in which local governments create specialized agreements with individual companies to ensure environmental compliance. The Japanese city of Yokohama was able to set an example on how its pollution control agreements with Electric Power Development Co., Ltd (EPDC) ensure the company's environmental compliance and improve their public image at the same time (Box 7.2).

Box 7.1
A success story on transportation control in Singapore

Since 1975, the Government of Singapore has introduced a series of traditional and experimental measures to slow down the growth of the motor vehicle population and to control its usage. These include an area licensing system and general price restraints, a quota system on new cars, a weekend car scheme, and an electronic road pricing (ERP) system. The various policies adopted by the government of Singapore to reduce traffic congestion and pollutant emissions have been largely successful because they are based on integrated city planning.

Other countries can profit from the Singapore experience:

- Periodical adjustments of policies using feedback from the public and other stakeholders made possible by transparency in policy formulation. Singapore has learned from its own practices: ERP charges are subject to review every three months, and charge structures and times change depending on traffic and economic conditions.
- Investment in infrastructure. Demand-side management supplemented construction of additional road infrastructure, proper road maintenance, coordination of traffic-light systems, and building of expressways and mass rapid transit. The taxes and fees imposed on vehicles generated huge financial resources, which were not only invested in demand- and supply-side management but also applied to reducing less-desirable taxes.
- Technology factors played important roles. For example, ERP depends on sophisticated technology that allows time-of-day pricing that reflects traffic conditions. A computerized traffic control system was already in place by 1986 in central business districts. It was replaced with a more advanced automated traffic signaling system called "Green Link Determining System", a traffic-adaptive signal control system monitored centrally to adjust to changing traffic conditions.

Source: Toh & Phang, 1997; Institute for Global Environmental Strategies (IGES), 2007

Box 7.2
Yokohama's pollution control agreements

The success of voluntary agreements can be seen in the example of Yokohama City. During the 1960s, the air and water quality of Yokohama was severely deteriorating due to rampant industrialization. Furthermore, Electric Power Development Co., Ltd (EPDC) in 1964 also wanted to build a new coal-fired power plant in Yokohama. Knowing that the national law will not be sufficient to control possible air pollution from the power plant, the local government signed a "pollution control contract" with EPDC, wherein the company committed to "take measures to achieve agreed targets beyond the levels required by the law".

Some of the targets in the agreement include:

- The concentration of sulfur dioxide (SO_2) should be below 500 parts per million (ppm).
- The amount of smoke and dust should be below 0.6 g/Nm³.
- EPDC should periodically monitor the density of smoke, noise level, wastewater, water quality, among others.

The EPDC was motivated to join the agreement because they needed local government approval before they can start building their power plant. Furthermore, the public was also involved in the transaction by informing them of the results of monitoring various pollutants.

Using voluntary agreements provided several unique advantages. First, the government can implement stricter standards compared to national laws based on agreement with important parties. Second, these agreements, unlike national laws, recognize the unique characteristics of environmental problems faced in different cities, Third, the government does not simply assume that all industries have the same capacity to reduce their emissions. Through constant consultation, companies and the local government can set a specific target that is more possible. Lastly, company image also improves in the community because citizens can see that these companies are environmentally conscious.

Source: Tsunoda, Inui & Takeuchi, 2002; Organisation for Economic Co-operation and Development (OECD), 2003; Matsuno, n.d.

Table 7.2 Factors considered in implementing strategies to prevent and/or control air pollution

Factor	Consideration
Technical	Effectiveness Sustainability under local conditions
Administrative	Feasible given the existing legal and administrative framework
Economic	Costs and benefits
Social	Equity in sharing of costs and benefits Culture of compliance
Political	Public support Stakeholder pressure

Source: SEI, 2008

National and local governments often employ a combination of regulatory instruments, especially as they develop and pollution sources multiply and diversify. The types of combinations will depend on the local context as well as the sets of broader governance arrangements in which they are embedded. Some of the factors that should be considered in selecting appropriate policy instruments are presented in Table 7.2.

In many cases, effective implementation of a variety of (as opposed to just a single) policy instrument(s) have been shown to lead to air quality improvements. In 2011, the European Environment Agency (EEA) evaluated selected policy instruments that have been introduced in the recent decades in the European Union (EU) to address emissions from key sources, road transport and industrial combustion (i.e., Euro emission standards for road vehicles and the EU directives on Integrated Pollution Prevention and Control and large combustion plants). The evaluation showed significant emission reduction compared to no-policy scenarios and potential for scaling up improvements in more countries following application of the policy instruments in all European countries (EEA, 2011).

7.1.3 Governance arrangements

Both the selection and combination of regulatory instruments are affected by different types of governance arrangements. Top-down approaches to governing air quality typically involves the national government crafting air pollution control policies and regulations with moderate levels of interaction with subnational governments or polluting industries. The emphasis for top-down arrangements is on achieving compliance with government-led regulations. An advantage of top-down approaches is that actions can be rolled out quickly, especially when political will is strong as was the case in China during a series of high-profile air pollution episodes (Box 7.3). Pure top-down approaches, however, are disadvantaged by limited scope for adapting regulations to different contexts, high requirement for government resources and manpower, and fewer opportunities for learning.

Air quality became a serious concern after a severe air pollution episode in Beijing at the end of 2011 drew widespread media attention and stimulated public debate. New social media, celebrity's advocacy, as well as online posting of pollution levels (including action by the US Embassy in Beijing) further increased this attention. Of particular concern was fine particulate matter ($PM_{2.5}$) as people became aware that these fine particles posed long-term health risks, and were not regulated and monitored. The result of this attention was a series of actions that illustrated both more top-down and bottom-up approaches to governance.

The first set of actions followed a more top-down approach. In February 2012, the Chinese national government issued the New Ambient Air Quality Standards and Technical Regulation on Air Quality Index (AQI), adding air quality standards and monitoring requirements for $PM_{2.5}$, ozone (O_3) and carbon monoxide (CO). The standards and regulations will come into effect in 2016, but monitoring began in 2012. The national government also put in place a clear timeline for establishing a nationwide monitoring network. By the end of 2014, 190 cities have set up monitoring networks and released real-time air quality monitoring data to the public in line with the national government requirements.

But following these reforms, an additional set of pressures from the bottom-up led to greater efforts to tackle $PM_{2.5}$. Reports of air pollution in China made headlines again in early 2013 when $PM_{2.5}$ in Beijing reached very high concentrations, and pollution covered a wider geographical area than that in 2011. For the first time, the public had access to real-time $PM_{2.5}$ data and mobile AQI applications were widely downloaded by smart phone users. Local governments responded fast to inform the public how to protect themselves and what they could do to reduce emissions, but the public pressure on the government to act swiftly is growing stronger than ever. As part of the response to urgently address the issue, China's State Council released its Action Plan for Air Pollution Prevention and Control (Action Plan) on 12 September 2013.

Source: Clean Air Asia, 2013

To a certain extent, cities will move from the more top-down to more **multi-stakeholder and multi-level approaches** as they develop and combine more instruments **to solve air pollution** problems. It is also important to note that rarely is any one approach applied in isolation.

While top-down approaches stress compliance, bottom-up forms of governance emphasize collaboration. Bottom-up governance arrangements often encourage different stakeholders, especially local governments, to work collectively towards innovative solutions and draw upon local knowledge to improve performance (Matland, 1995). In instances such as the Tokyo Diesel case, the initiative was led by the local government. From 1999, the Tokyo governor successfully raised public awareness on diesel emission control through various communication strategies. Following the awareness-raising campaign, the Tokyo Metropolitan Government enacted innovative regulations to ban the driving of dirty diesel vehicles in the metropolitan area, which was unprecedented in the country. This triggered a suite of diesel controls that gradually began to be replicated in other parts of Japan (Box 7.4). However, a bottom-up approach does not always consider the potential for scaling up at different levels of decision-making. It can also encounter difficulties when air pollution problems cut across sectoral and administrative boundaries.

A multi-stakeholder and multi-level approach is now widely considered for problems that encompass multiple sectors and administrative borders. This approach attempts to align different actors at different levels of decision-making; aiming for this alignment not only with national and local levels, but also regional and global levels. In some instances, this can even involve many actors identifying and sharing "good practices" across jurisdictions at different levels. These practices can be transferred from city to city and country to country through flexible non-governmental networks such as Clean Air Asia or the International Council for Local Environmental Initiatives (ICLEI). It is important to underline that multi-stakeholder approaches to governance do not necessarily involve a smaller role for different levels of government: on the contrary, governments frequently need to "steer" a diverse group of stakeholders in the shared search for pragmatic solutions and scale up context-appropriate versions of those solutions.

Box 7.5
China's Action Plan for Air Pollution Prevention and Control (Action Plan)

China's State Council released its Action Plan for Air Pollution Prevention and Control (Action Plan) on September 12, 2013. The Action Plan sets the road map for reducing air pollution and comprehensive control from 2013-2017 in China with a focus on three key regions – Jing-Jin-Ji, Yangtze River Delta (YRD) and Pearl River Delta (PRD). The Action Plan states that for the three key regions, annual average concentration of $PM_{2.5}$ should be reduced by 25 percent, 20 percent and 15 percent, respectively. For Beijing, annual average concentration of $PM_{2.5}$ should be controlled at 60 $\mu g/m^3$ level by 2017.

Box 7.4
Reducing emissions from diesel vehicles in Japan

One of the more interesting diesel control programs was actually initiated not by a national government but by local governments. In 1999, before the national government introduced stricter diesel vehicle regulations, the Tokyo Metropolitan Government established a "NO Diesel vehicle campaign". This was followed a year later by enactment of the Tokyo Metropolitan Environmental Security Ordinance that had as its centerpiece diesel vehicle regulations. The regulations require in-use diesel vehicles that do not satisfy particulate matter (PM) emissions standards to be retrofitted with emission control systems; otherwise the vehicles cannot be driven in Tokyo. This was accompanied by a suite of other measures designed to stop idling; prohibit use of fuel oils that discharge a greater amount of PM; and deploy vehicle pollution regulators to identify violating vehicles. Importantly, similar regulations were enforced by major prefectures and cities in the Greater Tokyo Area, and other prefectural governments (e.g., Osaka Prefecture and Hyogo Prefecture) also adopted comparable measures, leading to complementary national diesel reforms.

Source: Rutherford & Ortolano, 2008; DieselNet, 2012

To a certain extent, cities will move from the more top-down to more multi-stakeholder and multi-level approaches as they develop and combine more instruments to solve air pollution problems. It is also important to note that rarely is any one approach applied in isolation. For example, in the case of China's air pollution episodes, there was significant pressure from the general public and proactive steps taken by local governments. The decision from China's State Council focused on three key regions – Jing-Jin-Ji, YRD and PRD – further exhibited some of the elements of the multi-level, multi-stakeholder approach (See Box 7.5).

The types of governance and regulatory approaches will have to be tailored to the particular needs of a city. National and subnational contexts influence which policy instruments and arrangements are utilized. Different approaches to air quality governance may also be strongly influenced by the existing institutional context — i.e. China may be inherently more top-down than the Philippines. It further needs to be underlined that this is not always a perfectly sequential or linear process: most of the building blocks of the top-down approach may have to be in place for more multi-stakeholder approaches. Nonetheless, there are interrelated and mutually reinforcing core principles of environmental governance which should help address air quality challenges (See Table 7.3).

Table 7.3 Core principles of environmental governance systems

	Core principle	Description
Regulatory framework	Effective Laws	Environmental laws should be clear, even-handed, implementable and enforceable.
Capacity and Coordination	Human and financial resources	Agencies should have sufficient human and financial resources to design and carry out activities specified in laws and policies.
	Training and Learning	Agencies should be equipped with the knowledge and tools needed to carry out activities specified in laws and policies.
	Institutional Coordination	Roles and lines of authority for AQM should be clear, coordinated and designed to produce efficient and non-duplicative program delivery.
Participation and Accountability	Stakeholder Participation	Stakeholders should be afforded opportunities to participate in environmental decision-making.
	Accountability	Environmental decision-makers, both public and private, should be accountable for their decisions.
	Disclosure/Information Dissemination	Environmental information should be collected, assessed, and disclosed to the public.
	Dispute Resolution	Stakeholders should have access to fair and responsive dispute resolution procedures.

Source: Adapted from USEPA, 2011

The core principles can be roughly divided into three areas: regulatory framework, capacity and coordination, and participation and accountability.

The regulatory framework involves putting in place the underlying system on how to move forward with implementation from general legal mandates. The regulatory framework articulates the infrastructure by which other components – such as accountability, review, institutional framework and coordination mechanisms – are outlined.

Capacity and coordination refers to sufficient financial and human resources and clear lines of authority that government agencies and other stakeholders will typically need. The well-defined roles and responsibilities of government agencies and other stakeholders would enhance effectiveness and minimize conflict or possible inaction due to overlapping authorities. Both capacity and coordination can be further

bolstered by well-designed training programs that equip stakeholders with the tools and knowledge needed to carry out provisions in policies and laws. The end-result will be effective laws that are implemented in a manner that help resolve issues as intended.

In terms of participation and accountability, the process of designing and implementing policies will typically be enhanced with context-appropriate channels for stakeholders to offer inputs into those policies. This will not only help enrich the design of policies but ensure that agencies charged with implementing those policies are accountable for their performance. Increased transparency and stakeholder participation in the process could lead to positive reception and buy-in of air pollution control policies implementation. Mechanisms that spell out rules for settling disputes can help resolve claims of unfair enforcement and build additional faith in the policies and implementing agencies.

As suggested in Figure 7.1, the core principles within and across these categories can reinforce each other. Figure 7.1 also illustrates that in many cases, these core principles will help put in motion the development of different policy instruments and governance arrangements outlined previously in the chapter. As with the instruments and arrangements, the application of these principles will vary across cities and countries depending on the existing institutional context.
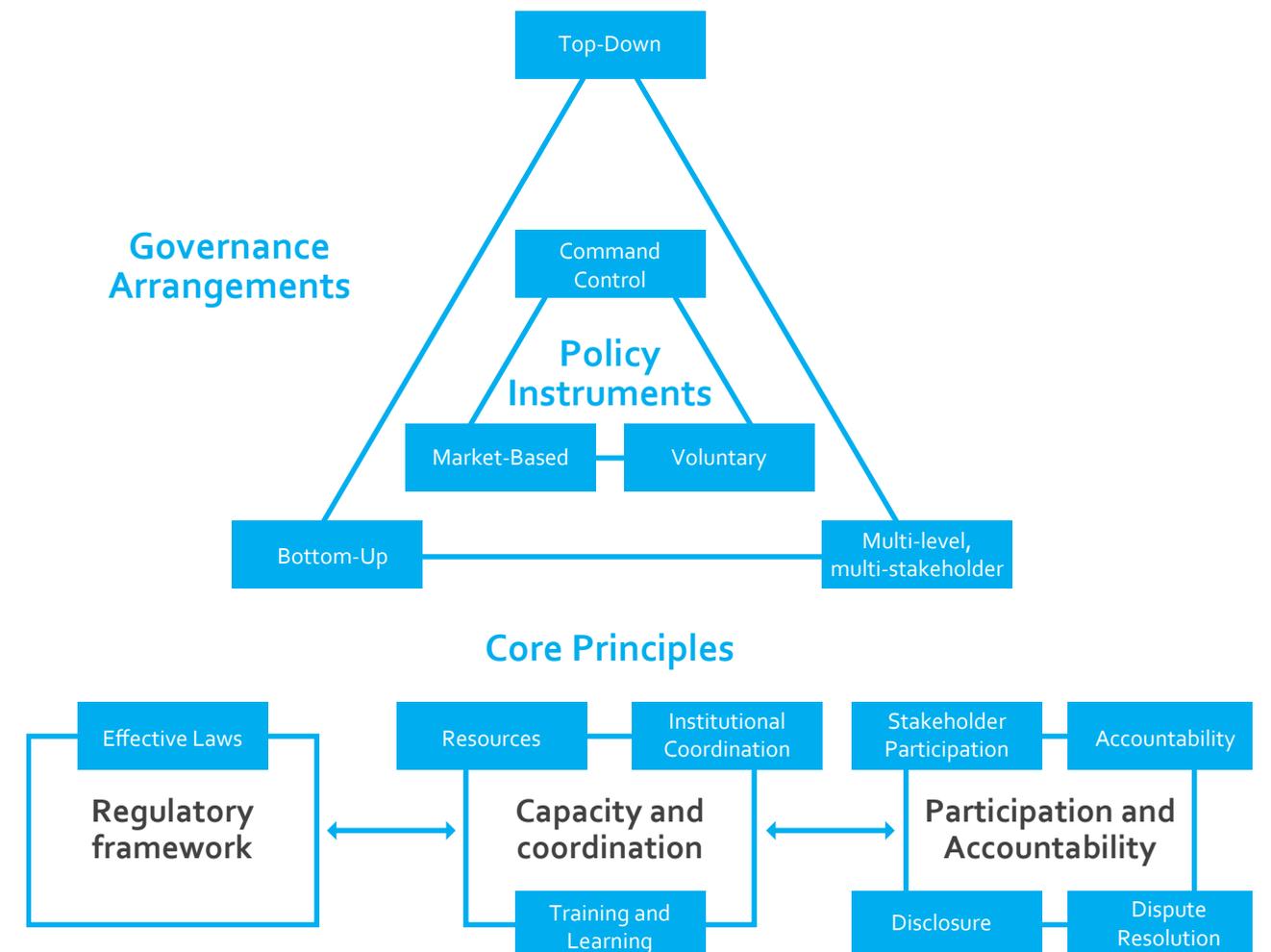

Figure 7.1 Environmental Governance Framework

7.2   Stages of air quality governance

Governance is essential to improving air quality. As a starting point, Table 7.4 presents indicators that would aid cities in identifying their current state of AQM for governance. The key factors for consideration include:

- Clear, implementable, and enforceable environmental policies and measures, and an enabling environment for implementation of measures;

- Clear institutional mandate and effective institutional arrangements between and within government agencies and offices involved in AQM;
- Meaningful stakeholder participation and engagement including access to environmental information, and
- Provision for accountability through review and evaluation of compliance and enforcement.

Table 7.4 Stages of air quality governance

Stages	Indicators
Underdeveloped	Mandate for AQM is not clear. Political support for AQM is lacking. Insufficient human and financial resources. Capacity developing activities are primarily ad hoc, and rely heavily on external organizations. Absence of mechanisms for stakeholder engagement and participation.
Developing	Overlapping mandate and responsibilities for AQM. Limited coordination between different ministries/agencies and local government working on AQM components. Political support for implementation of clean air measures is inadequate. Limited understanding of level of enforcement of policies and measures. Focus is chiefly on CAC regulations and top-down forms of governance. Stakeholders are engaged on an ad hoc basis.
Emerging	Clear mandate for AQM at the national and subnational level identified. Growing political support for implementation of clean air measures. Strategies to evaluate compliance and enforcement of policies exist for specific sectors. Financial support is available from national/local government. Opportunities for capacity development on AQM are available. Knowledge of different forms of regulation and governance growing. Mechanisms to engage various stakeholders through information disclosure exist or are in place.
Maturing	Clear institutional mandate of different ministries and local departments on AQM, including coordination with neighboring cities. Political and public support for implementation of clean air measures is adequate. Strategies to evaluate compliance and enforcement of policies to address air pollution is in place. Sufficient human and financial resources are available. Capacity development systems exist at the national and subnational levels. Mechanisms to engage various stakeholders to support national and subnational government in implementing clean air policies exist or are in place. New approaches to regulation are piloted and lessons learned are growing in number and scope.
Fully developed	Institutional mandate of different ministries/agencies and local departments on AQM, including coordination with neighboring cities, is well-defined. Strong political and public support for implementation of clean air measures. A system is in place to evaluate compliance and enforcement of policies and feeds back to policy development process. Sufficient human and financial resources are available. Innovative strategies to secure financial resources are also in place. Continuous capacity development systems exist. A process to integrate a variety of regulatory approaches and engage various stakeholders in AQM is institutionalized.

7.3 Issues and challenges

Asian cities and countries face a number of institutional, management and financial challenges in moving from one stage of air quality governance to another.

Institutional

- **Unclear and/or overlapping mandates and roles** for various agencies and stakeholders involved in AQM. Given that air pollution is a complex environmental issue, it is a concern not only for environmental agencies but also for energy, transport, industry, planning, health and meteorology agencies at both national and local levels.
- **Ill-defined coordination and communication mechanisms between various agencies and institutions**. Absence of well-designed coordination mechanism can lead to inter-agency conflicts that can hinder the development and weaken enforcement of policies and regulations (SEI, 2008). These problems are particularly acute for air pollution issues that cross geographical boundaries.
- **Need for institutional capacity strengthening.** At the extreme, countries and cities may even lack human resources to understand urban air quality, effectively leaving the issue off the government agenda. In some countries and cities, addressing air pollution is already mandated to government agencies; however, agencies and institutions are not well equipped with knowledge of systematic AQM approaches, technical skills, and other critical enablers of implementation. Many government agencies in developing Asian countries lack capacities for enforcement and monitoring compliance (World Bank, 2007).
- **Few systematic and needs-based capacity building mechanisms are available** for policymakers, regulators and various stakeholders to address air pollution that can help determine levels of capacity and potential gaps.
- **Minimal opportunity for stakeholder engagement and participation.** The lack of mechanisms on how various stakeholders can be engaged in AQM can be problematic on several counts. First, there are fewer opportunities to identify workable solutions from those emitting or affected by pollution. Provisions for civil society to file appropriate civil, criminal or administrative action in courts, for instance, can discourage polluters from exceeding standards. Second, stakeholder engagement to fill capacity gaps is not tapped. Knowledge and resources of stakeholders which could complement the work of the regulatory agencies are not utilized; there is a need to maximize opportunities for cooperation under a notion of shared responsibility for air quality improvement.

Management

- **Lack of appropriate monitoring and review system** constrains the ability to measure progress in AQM. Several Asian countries and cities are unable to determine whether the air quality actions have resulted in improvements in air quality levels. In the same manner, limited review system hinders understanding whether the mitigation action is addressing the key emission sources.
- **Limited political and public support for air quality action due to communication gaps.** A lack of vision, political will and public support can undermine even well-designed regulations. Effectively communicating the severity of health impacts of air pollution to constituents in terms of economic value is one way to gain political support for air quality management (SEI, 2008) [See *Guidance Area 3 on Health and other impacts and Guidance Area 4 on Air quality communication*].

Financial

- **Insufficient financial and human resources** can undermine institutions charged with enforcing regulations. Lack of resources is often a symptom of both limited financing from public sources as well as limited attempts to tap innovative ways of accessing resources such as private-public partnerships.
- In much of developing Asia, the **percentage of public finance allocated to environmental protection has remained a small fraction** of gross domestic product (GDP); let alone air pollution.

7.4 Roadmap for improving air quality governance

To progress towards a fully developed stage of air quality governance, there are a number of steps at each stage that the city – and if applicable, provincial or national authorities – should take (refer to Table 7.5). **Annex VI of the *Information Sourcebook* provides additional information on moving forward with these recommendations.

Table 7.5 Roadmap for improving air quality governance

| Developmental stages	Steps to follow
Underdeveloped	**Management Process** *Institutional coordination, capacity and training* • Define essential AQM roles and responsibilities • Conduct stakeholder mapping and determine whether existing organizations can fill needed AQM roles and responsibilities • Vest authority for AQM with an existing or new lead agency/department based on stakeholder mapping • Assess overall budget for AQM and allocate government funding to cover essential roles and responsibilities *Stakeholder engagement, participation and accountability* • Involve prominent figures/local champions in publicizing the formation of the AQM agency to mobilize general public, media and other stakeholder support • Design complementary public advocacy and awareness campaigns (with engagement of above champions) to place air quality squarely on the policy agenda [See *Guidance Area 4 on Air quality communication*] **Technical Process** • Seek technical assistance from international agencies, international non-governmental agencies, and bilateral agencies in establishing AQM agency, filling budgetary needs, and strengthening stakeholder communication • Seek city partnerships to learn how others cities set up AQM agency, allocate budgets, and communicate with other stakeholders
Developing	**Management Process** *Institutional coordination, capacity and training* • Assess capacity needs through a training needs assessment and hire needed additional staff within budgetary limits • Actively engage prominent public figures/local champions in public advocacy and awareness campaigns to share essential air quality information • Design communication, data sharing and reporting mechanisms within lead agency based on organizational structure • Clarify institutional relationships with other relevant city agencies (i.e. transport) and national environmental agencies/air pollution divisions • Determine where and how cooperation should be strengthened with relevant city and national environmental agencies/air pollution divisions • Continue to assess and allocate government funding while mobilizing additional resources through city taxes and fiscal policies as well as national and international finance *Stakeholder engagement, participation and accountability* • Use advocacy and awareness campaigns to promote public and stakeholder participation in activities to reduce air pollution (i.e. car free day)

Developing	• Clarify organizational structure and division of labor for core AQM functions within lead AQM agency, potentially including: (i) pollution prevention; (ii) risk assessment and reduction; (iii) scientific research and technology; (iv) regulatory education; (v) regulatory development; and (vi) enforcement[1]
	
	Technical Process
	• Design effective enforcement program with the following components:
	  ° Creating enforceable requirements for emission sources
	  ° Identifying which sources are subject to which regulatory requirements and provisions.
	  ° Promoting and monitoring regulatory compliance
	  ° Responding to violations
	  ° Clarifying roles and responsibilities
	• Evaluating the success of the program and holding program personnel accountable for performance

Emerging	**Management Process** *Institutional coordination, capacity and training* • Conduct capacity building activities through existing in-house training programs where available or outside organizations where expertise is lacking • Clarify roles and responsibilities of other relevant government agencies and non-governmental stakeholders (such as civil society, academe, research institutes, media, private sector, among others) to fill possible capacity needs or related AQM functions • Continue to assess and allocate government funding while mobilizing additional resources through city taxes and fiscal policies as well as national and international finance • Develop communication, data sharing and reporting mechanisms for other relevant city and central government agencies *Stakeholder engagement, participation and accountability* • Develop mechanism for public information dissemination (i.e. sharing air quality data) to enhance transparency, strengthen accountability and build political will • Develop stakeholder engagement and consultation mechanisms to provide input and oversight on some core AQM functions, including: (i) pollution prevention; (ii) risk assessment and reduction; (iii) scientific research and technology; (iv) regulatory education; (v) regulatory development, and (vi) enforcement **Technical Process** • Design AQM policies and measures using clear and enforceable language and identify and implement appropriate regulatory instruments, possibly combining CAC with MBIs [See *Guidance Area 5 on Clean air action plans*] • Develop mechanisms to collect information and assess regulatory compliance through (i) inspections; (ii) self-monitoring, self-record keeping, and self-reporting; (iii) citizen complaints/monitoring; and (iv) area monitoring

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1   Urban Air Quality Management Strategy in Asia. Guidebook. https://www.elaw.org/system/files/handbook.pdf

Developmental stages	Steps to follow
Maturing	**Management Process** *Institutional coordination, capacity and training* • Enhance capacity building activities with possible re-assessment of needs • Strengthen and broaden communication, data sharing and reporting mechanisms for other relevant city and central government agencies • Begin initial collaboration with neighboring cities for regional AQM, possibly starting with information sharing and data exchanges • Continue to assess and allocate government funding while mobilizing additional resources through city taxes and fiscal policies as well as national and international finance • Explore innovative financing mechanisms, including partnering with private sector *Stakeholder engagement, participation and accountability* • Strengthen and broaden mechanism for public information dissemination (i.e. sharing data on air pollution, health impacts, climate change and other co-benefits) • Strengthen and broaden stakeholder engagement and consultation mechanisms to provide input and oversight on relevant AQM functions **Technical Process** • Continue to identify and implement appropriate regulatory instruments, possibly combining CAC with market-based and other instruments (such as voluntary) [See *Guidance Area 5 on Clean air action plans*] • Strengthen and broaden mechanisms to collect information and assess regulatory compliance through (i) inspections; (ii) self-monitoring, self-record keeping, and self-reporting; (iii) citizen complaints/monitoring; and (iv) area monitoring • Review and evaluate effectiveness of local clean air action plan, building on information gathered during compliance monitoring activities
Fully developed	**Management Process** *Institutional coordination, capacity and training* • Continue to conduct capacity building activities, with re-assessment of training needs, as necessary • Establish and strengthen partnerships with organizations who can help build capacities in other cities • Collaborate with neighboring cities on regional AQM, possibly including harmonization of standards, joint monitoring and development of management measures, and collaborative capacity building • Continue to assess and allocate government funding while mobilizing additional resources through city taxes and fiscal policies as well as national finance • Explore innovative financing mechanisms, including partnering with private sector *Stakeholder engagement, participation and accountability* • Continue to strengthen and broaden mechanism for public information dissemination (i.e. sharing data on air pollution, health impacts, climate change and other co-benefits) • Continue to broaden stakeholder engagement and consultation mechanisms to provide input and oversight on relevant AQM functions • Sustain political and public support through mechanisms that enhance transparency, accountability and communication strategies [See *Guidance Area 4 on Air quality communication*]

Developmental stages	Steps to follow
Fully developed	**Technical Process** • Continue to identify and implement appropriate regulatory instruments, possibly combining CAC with market-based and other instruments (such as voluntary) [See *Guidance Area 5: Clean air action plans*] • Continue to strengthen and broaden mechanisms to collect information and assess regulatory compliance through (i) inspections; (ii) self-monitoring, self-record keeping, and self-reporting; (iii) citizen complaints/monitoring; and (iv) area monitoring • Review and evaluate effectiveness of local clean air action plan, using environmental results and other indicators to assess compliance rates, indirectly measuring compliance, number of enforcement responses, monetary penalties assessed
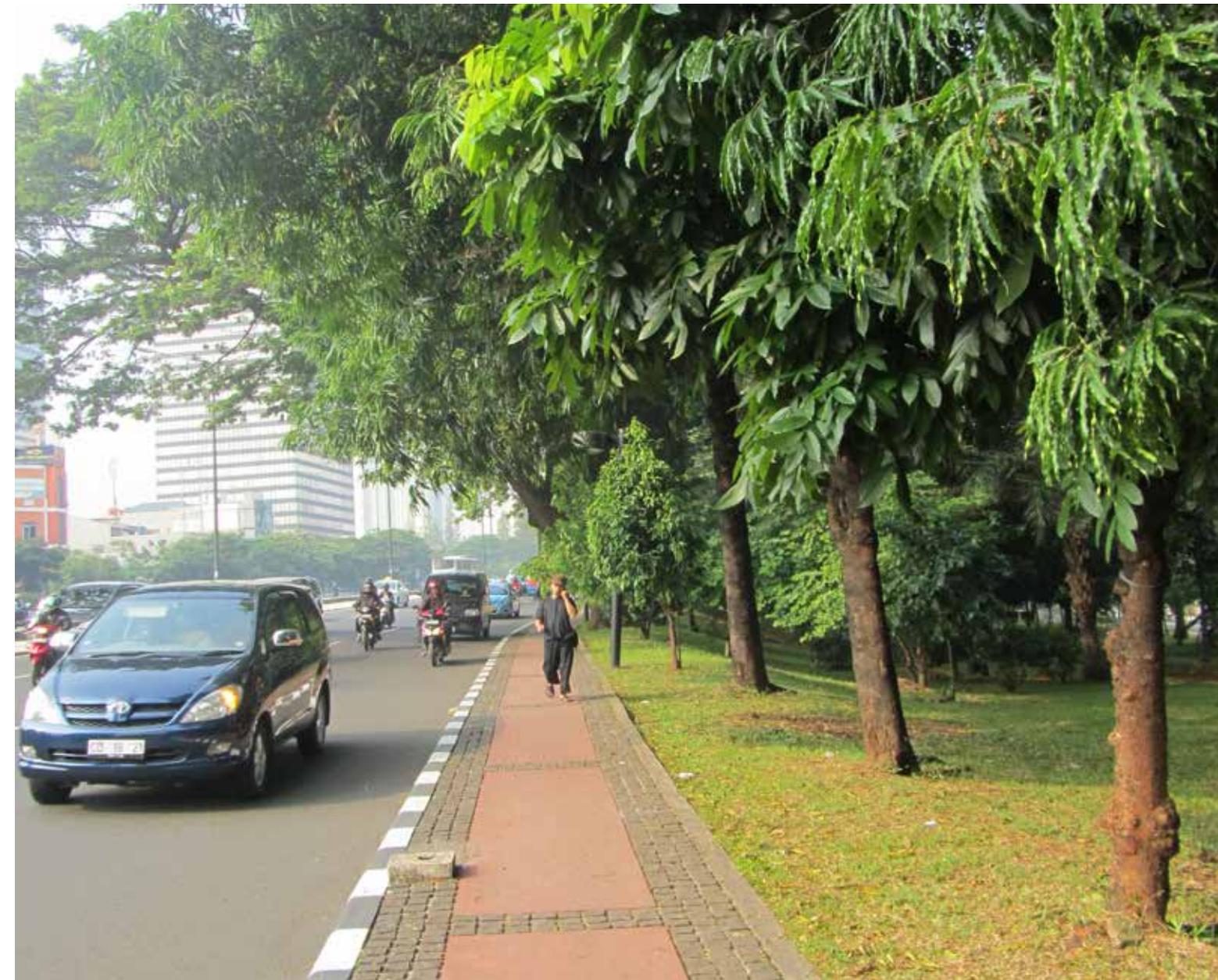
7.5 References

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