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Reforms for Managing Urban Environmental Infrastructure and Services in Asia

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Most Asian countries are undergoing reforms to bring improvements in local environmental governance. Decentralization, private-sector participation, and community participation are the major reforms contributing toward good governance, including in urban environmental management. Increasing demand for adequate environmental services and effective natural resource protection, because of rapid urbanization and economic growth, is pushing national and local agencies to accelerate reform. This article reviews environmental reforms and their practical applications in solid waste management, water supply and wastewater management, and air quality management in 14 Asian cities. There have been considerable improvements in the quality and coverage of urban environmental infrastructure and services in these cities. These improvements can be further optimized by improving the combination of reforms for the targeted service: building the capacity of local government institutions, community enterprises, and civil society; and modifying initiatives and programs to address diversified needs and characteristics within the same city.

Keywords: *community participation; decentralization; environmental services; private-sector participation; urban Asia*

Asia is facing enormous urban environmental challenges in the wake of an urban population explosion because of industrialization and economic growth. On one hand, there are increasing demands for already-depleting natural environment resources and environmental services because of increasing population and economic activities. On the other hand, national and international priorities to provide

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safe water and sanitation, solid waste management, and clean air, under various initiatives including the Millennium Development Goals,¹ require prompt and appropriate investment to improve the coverage and quality of environmental infrastructure and services.

Most Asian countries have started implementing reforms to promote decentralization, private-sector participation, and community participation to improve the efficacy and efficiency of urban environmental management. Urban environmental management includes infrastructure and services, and protection of natural resources in cities (Hardoy, Mitlin, & Satterthwaite, 2001; World Bank, 1996). However, in most cities, no single institution is responsible for all urban environmental management issues (Leitmann, 1999). In most Asian cities, three priority sectors cover most urban environmental issues: water supply and wastewater, solid waste, and air quality (Economic and Social Commission for Asia and the Pacific & Asian Development Bank, 2000; World Bank, 1999, 2000).

This article analyzes reforms in decentralization, privatization, and community participation related to urban environmental management in 14 Asian cities. The next section proposes a hypothesis to analyze the reforms with reference to underlying targets of improving efficacy and efficiency of environmental services and environmental protection in Asian cities. The third section highlights the overall targets and implementation process of these reforms. The fourth section uses case studies to analyze and discuss the impacts of these reforms on water, waste, and air sectors and the challenges for optimizing their impact. The article concludes by identifying important lessons for the process, targets, and implementation of urban environmental reforms in Asia.

Reforms to Improve Urban Environmental Management

As noted above, there have been three major reforms in urban environmental management in Asia, namely, those relating to decentralization, private-sector participation, and community participation. Reforms for decentralization are broader in nature, and their target is not only improvements in municipal service delivery but also overall urban governance including administration, police, education, and so on. Therefore, in some places, decentralization may help to improve the level of environmental services; however, it is also possible that it may deteriorate the level if the proper institutional reforms are not implemented and the direct link between improvements in the service delivery and decentralization is not established (Klugman, 1994). Most of the reforms are meant to bring about institutional change and fiscal rearrangements between the local and national governments.

Reforms for private-sector participation are mainly targeted to improve the level of infrastructure and services; however, this may not guarantee overall improvements in the urban environment (UN Habitat, 2003). For example, if proper monitoring is not in place, the private sector may discharge polluted water, without proper treatment,

into fresh water sources. The private-sector company, managing a water supply system, may encourage the consumption of water rather than conservation to maximize revenue and profits. Similarly, the private sector, managing public mass transit systems, may create the need for journeys instead of motivation for walking and cycling. The private sector responsible for solid waste management may encourage its customers to increase consumption and waste generation, as the more waste is generated, the higher profits will go.

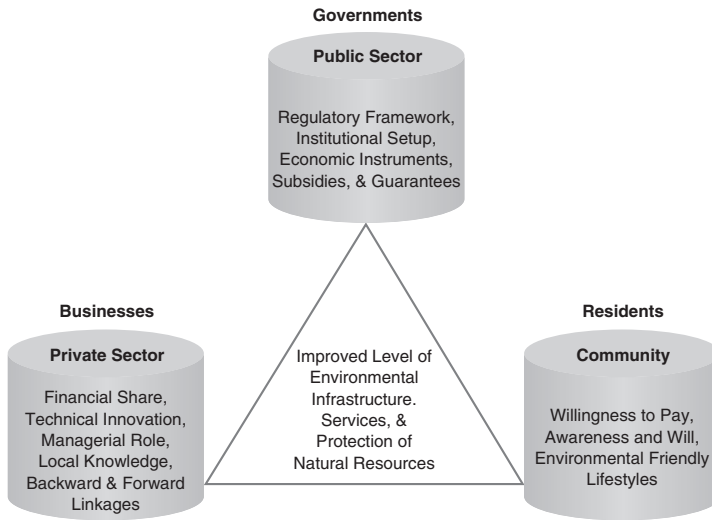
Reforms to increase community participation may also backfire, if instead of coherence with public and private sectors, communities come into conflict with vested interests. With increased participation, communities may improve management of urban environmental services and monitoring of those aspects of environmental services delivered by other parties. Vested interests can exploit this empowerment and like infamous “land mafias” in many countries, “solid waste mafias,” “water mafias,” and “transport mafias” can pop up. The other major challenge could be the pace of community participation as in many cases it takes a long time to make community participation work (Narayan, 1995), whereas national and international priorities may require prompt delivery of public services.

Clay and Porter (2003) suggested that environmental and natural resource management offers the greatest new challenge to local governments in this regard. Now, service providers may be autonomous bodies or private enterprises, whereas government forms the regulatory framework and functions as an impartial regulator. The service provider needs to bring investment and technology to improve the level of the service and reduce the cost. Consumers get reliable services, for which they are made responsible to pay either full cost or a subsidized cost, depending on the social policies of the government. Payments for services also induce behaviors to conserve resources and avoid exploitation of the environment. Community participation is essential to raise willingness to pay and willingness to adapt to environmentally friendly lifestyles (see Figure 1).

Targets and Implementation of Reforms

Reforms to improve urban environmental management can be identified in two categories. The first category covers broad-based reforms to bring improvements in governance at the local level. Reforms on decentralization are targeted to improve accountability and effectiveness of local governments in all sectors. Similarly, reforms involving the private sector and strengthening community participation target all basic services. These reforms, if successful, would contribute to improving the level of environmental services and environmental protection. The second category is sector-specific reforms for water, solid waste, and air. Decentralization at this level is specifically targeted to improve the quality and coverage of the services and level of environmental protection. Private-sector participation-related reforms at the sectoral

Figure 1
Reforms to Change Role of Government, Private Sector, and Residents



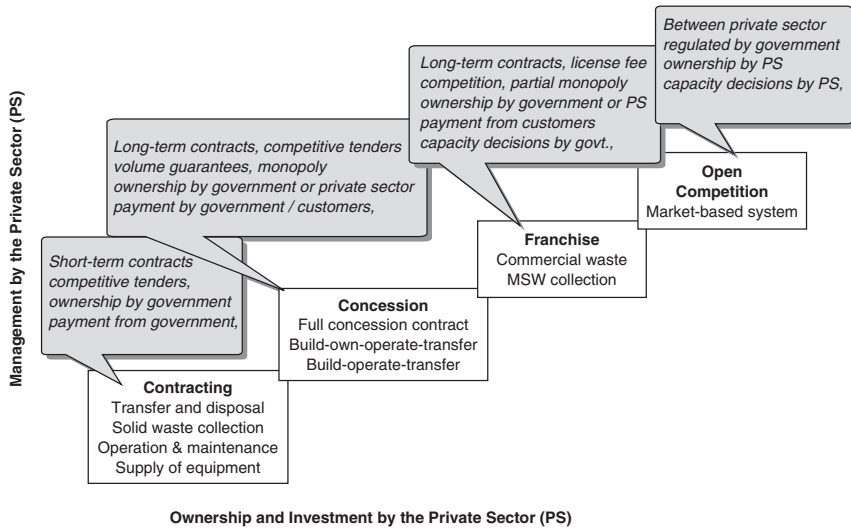
Source: Authors.

level target efficiency in investment and management. Community participation in urban environmental management is targeted to improve community-level services, where it is difficult for public and private sectors to perform.

Targets

Reforms are carried out to improve the situation of either overall governance or in any targeted sector. Decentralization, which can be regulatory, institutional, financial, or a combination of all, is primarily focused to achieve good governance. One of the criteria for good governance is to provide adequate and affordable public services and better environmental quality for residents. Regulatory decentralization empowers local governments or local sectors to formulate appropriate regulations to protect public health and the natural environment by minimizing various forms of environmental pollution. Institutional decentralization empowers local institutions to take decisions at the local level, so these institutions would be directly accountable to residents or to the customers of public services. Financial decentralization enables local institutions to generate and spend their revenue in accordance with public priorities at the local level. This may be the basis for national and international agencies to

Figure 2
Management and Ownerships in Various Forms
of Private-Sector Participation



Source: Memon, Kleiss, Imura, & Shirakwa (2004).
 Note: MSW = municipal solid waste.

push reforms on decentralization, as decisions and accountability will be at the local level through stakeholder participation. Institutional and financial decentralization of public services in various forms² is being carried out to improve efficient and effective delivery of services.

Private-sector participation is mainly sought in urban infrastructure and services as the public sector is finding it difficult to meet the investment levels required to improve the coverage of these services. The private sector is also offered a role in the management of public services to reduce inefficiency losses so that public spending and subsidies can be optimized. Private-sector participation is being introduced through national and local reforms for provision of public services. Water utilities, solid waste management, and public transport services are being managed by the private sector to increase investment and coverage, reduce losses, and improve the quality of these services. Private-sector participation can be found in various forms depending on the targets (see Figure 2).

For urban environmental management, community participation can be targeted for four different objectives. First, community groups can provide environmental

services and infrastructure, especially in the slums or in the poor areas, where the private sector is unable to deliver because of very low profit margins. Second, community groups or enterprises can also contribute to larger projects, which are being run by either private- or public-sector organizations. Third, community participation aims to improve the level of services or level of accountability of the service provider, which could be a private-sector company or a public-sector organization. Similarly, community groups could be involved in monitoring environmental pollution from various sources. Fourth, community participation is essential to build public awareness to adapt to environmental friendly lifestyles.

Implementation

Decentralization. Klugman (1994) referred to the three modes of decentralization: deconcentration, delegation, and devolution. Uphoff (1986) suggested that to understand decentralization, one must ask where the persons making decisions were located and to whom they were accountable. He further elaborated that devolution is a case where decision-makers are located noncentrally and are accountable to local populations; if only decision making is being decentralized without making decision makers accountable to the local people, then this is only deconcentration. Therefore, bringing decision makers closer to the people, accompanied by established mechanisms of local accountability, can improve the overall effects of decentralization (Klugman, 1994). The current focus of the debate is on the level of fiscal decentralization for revenue generation and expenditures by local governments (Clay & Porter, 2003).

Most countries in Asia have a history of local governance in one form or other. During the period of colonialism, it was effective to manage the governments through centralized power structures (Aliani, 2002). The postcolonialist era was focused on nation building, industrialization, and further consolidation of centralized power structures in many countries. In many countries, the national constitution provides that there is a role for local governments; however, most of the decisions and revenue generation remains with the national governments. There were variations across countries, based on their political situation and socioeconomic characteristics. For example, Bangladesh attempted a local government system for many years only through nomenclature of tiers; however, nothing was done to strengthen local institutions until 1996 because of political instability at the central level. On a different note, local governments found themselves in a strong position during militia rule, rather than during those periods of democratic national governments.

In Southeast Asia in Malaysia, a former British colony, the local government system was in turmoil during the early years of the country's independence, and now it is evolving with its own identity. In contrast, in the Philippines and Indonesia, local governments were recognized in the constitutions since their early years. In East Asia, Japan's constitution recognizes local autonomy; however, in South Korea it

took nearly 50 years before the promises of local autonomy were fully realized in 1995. In China, the political and economic reforms were decided in 1987, and 5 years later, political reforms were carried out to construct socialist democratic politics with Chinese characteristics (Aliani, 2002; Brillantes & Cuachon, 2002).

However, either because of ineffectiveness of the local governments or unavailability of constitutional support for the local government system, decentralization has been pushed through national and international agencies in the recent years. Japan is recently pursuing a “third wave of the reforms” or “triune reform” to further decentralize local governments for revenue generation and expenditure based on inter-governmental relations (Saito, 2003). In Indonesia, fiscal decentralization has its basis in Law No. 22 of 1999 on regional administration and in Law No. 25 of 1999 on financial balance between the central government and the regions (Sidik, 2003).

In Thailand, the new constitution, which supports decentralization, was passed in 1997. In the Philippines, the local government code of 1991 is a comprehensive document on local government systems focusing its structures, functions, and powers that also include taxation and intergovernmental relations. In India, the 74th constitutional amendment act of 1992 provides more powers to the local governments (Brillantes & Cuachon, 2002). In Pakistan, the current government has restructured the local government system to suit local situations. An overview of decentralization in Asian countries is summarized in Table 1.

All these changes are meant to improve local governance by making it accountable and responsive to the needs of the local population. An important aspect of local autonomy is the transfer of power from local authorities to other parastatal (semi-government) agencies through corporatization or through privatization (Aliani, 2002). Local governments should be capable of improving the situation of local infrastructure and services through the generation of their own resources by providing autonomy to service operators and making them accountable for their efficiency, or by forming partnerships with private-sector and community enterprises.

Therefore, decentralization clarifies the role of service provider, regulator, and consumer. Initially, government was the service provider and regulator, and the consumers or the community were not willing to pay for these public services either because of low quality and reliability or the assumption that these services are basic rights and should be provided free of cost (Memon & Matsuoka, 2001).

Private-sector participation. To bridge the gap between demand and supply of infrastructure and services, many countries are seeking private-sector investment in the wake of rapid urbanization and economic growth. The private sector varies in its scale and its focus. Most of the time, private-sector participation is meant for multinational corporations seeking foreign direct investment (FDI), as well as expertise (Berg, Pollitt, & Tsuji, 2002). These multinationals may have a different focus, as some are only investors, some are consultants, and some are contractors or suppliers. The second type of private sector is local enterprises, including small and medium-sized

Table 1
Key Decentralization Reforms in Asia, 1972-2001

Country	Reform
Bangladesh	The establishment of local governments was embedded in the 1972 Constitution.
Cambodia	The Administration of Commune Law was ratified in 2001, set the decentralization process.
China	The fiscal reform of 1994 assigned local governments with significant revenue generating capacity.
Indonesia	A new decentralization framework was established on January 1, 2001, by MPR Decree No. IV/ MPR/ 2000.
Japan	In 1999, the Package Promoting Decentralization Act was enacted, taking force in 2000.
India	The 73rd Amendment to the Constitution in 1992 is considered a landmark development.
Laos	A new Lao Constitution was passed by the Supreme People's Assembly on August 15, 1991.
Mongolia	A new Constitution adopted in 1992 declared a decentralized intergovernmental system
Nepal	In 1999, a Local Self-Government Act was promulgated that is considered a landmark legislation.
Pakistan	The Pakistan Local Government Ordinance of 2001 laid out an administrative structure for local governments.
Philippines	The Philippines Local Government Code was enacted in 1991 to devolve authority and responsibility.
South Korea	The revised Law on Local Autonomy established municipal assemblies in December 1990.
Sri Lanka	The Provincial Councils Act, and Pradeshiya Sabhas Act, both were passed in 1987.
Thailand	The 16th Constitution was adopted in October 1997; the National Decentralization Act was passed in 1999.
Vietnam	In 1996, the Budget Law pushed the boundaries of what provincial governments could do.

Source: Authors.

enterprise (SME). Their focus also varies, but most are contractors and suppliers. The local private sector usually joins hands with multinational companies to share the work and also to help the international private sector meet the requirements for local shares. In small towns or in the small components of a big project, they may take an individual role. The third type is of community enterprises, which are mainly focused on community-based infrastructure and services.

Many of the recent reforms focus on scaling-up private financing initiatives (PFI) in water supply and wastewater services, solid waste management, and urban transport, including elevated and underground mass transit systems (see Table 1). In Japan, Law 117 was issued in 2000 to allow the utilization of private capital in the construction of public facilities. In South Korea, an act on private investment in social overhead facilities was introduced in 1999. The act of infrastructure construction

was also modified to introduce build operate and transfer (BOT), and this method of investment and managing infrastructure is helping South Korean contractors obtain international BOT contracts.

In China, targets for urban environmental infrastructure and services were included in the 10th 5-year plan, and the increased role of private finance was recognized. Policies on municipal solid waste disposal and pollution prevention technology were issued in May 2002 that clarified the role of private-sector participation. The State Development Planning Commission (SDPC) transferred the right of review and ratification for some projects to provinces and autonomous districts in 2001; this also introduces the role for foreign capital in those projects. In 2002, SDPC, in collaboration with the other ministries and departments, published "Guidelines for Investment Industries by Foreign Companies," including urban sewerage treatment and municipal solid waste treatment (Chang, Memon, & Imura, 2004).

In Southeast Asia, the Philippines introduced the BOT law in 1993, which was initially meant to scale up finance in electric power generation. In 1995, the Water Crises Act was established to increase private-sector participation in water utilities, mainly to improve the situation in metro Manila. In Indonesia, where PFI is already increasing, the promulgation of Electricity Law No. 20/2002, a comprehensive legal framework for the development of electricity sector, initially paved the way for private-sector participation in this sector. In early 2004, the Indonesian House of Representatives approved the new draft of the Water Resources Law. This expressly provides that the private sector may participate in the provision of water (Adhyaksa, 2004). In Thailand, in March 1992, the Royal Act on Private Sector Participation in State Affairs, which forms the basis of the ongoing reforms, was promulgated. In Vietnam, the BOT Act was promulgated in 1993 resulting in an increasing number of BOT projects, mostly financed by international donors.

In South Asia, Pakistan passed the new National Water Law to reform institutions. In Nepal, policies were developed in 1990, and later in 1996, to involve the private sector. In India, state-level reforms are being introduced to increase private-sector participation in public services (see Table 2).

Community participation. Community participation is being encouraged by international, national, and local organizations in environmental infrastructure and services as well as for environmental protection to improve the effectiveness and efficiency of programs and projects. Community participation could be a goal in itself for broader development objectives, and it could be a means for more-specific projects and programs. Community participation has a different meaning in different contexts (Mansuri & Rao, 2004). The process of decentralization also improves the level of community participation through formal and informal institutions. As local governments are taking on more responsibility to provide basic services, they are engaging the private sector and communities to assist them. Partnerships with the community could be realized with an increased level of community participation

Table 2
Major Private-Sector Participation Reforms and Activities in East Asia

Country	Reforms	Major Activities
China mainland Macao	“Build-operate-transfer” (BOT) based public projects by local governments. Relevant regulation promoting BOT are in place and most successful example in the region.	Three national BOT pilot projects and more than 50 local projects. Water supply, wastewater, and solid waste under private sector.
South Korea	Target for private finance initiatives (PFIs) set at 40% by 2001-02.	BOT projects are increasing.
Japan	Introduced law concerning public facilities construction through private capital in 1999.	
Malaysia	Privatization Master Plan was introduced in 1991.	A number of projects under private-sector participation (PSP).
Thailand	The 1992 Environment Act and 1992 Royal Act on Private Participation in State Affairs and adaptation of Privatization Master Plan in 1998.	Sky-train and underground in Bangkok. Projects in water and waste sector are also under way.
Indonesia	The government has formulated relevant regulations to promote PFI based projects.	Several BOT projects, including water supply in Jakarta.
Philippines	The first BOT Law in Asia was issued in this country in 1990.	The famous privatization of water utilities in Manila during 1997.
Vietnam	Vietnam issued BOT Law as early as 1993	Various projects are in progress

Source: Adapted from Chang, Memon, & Imura (2004) with additional input from author.

(Ghai & Vivian, 1995). Although it is generally perceived that community participation brings success to the projects in terms of efficiency and effectiveness (Narayan, 1997), it depends on the scale, resources, and timeline of that project.

Community groups and local nongovernmental organizations (NGOs) began community participation process for urban environmental services. This includes door-to-door collection of solid waste and street cleaning, sale of water either door-to-door or by establishing water storage and selling points, sanitation services including periodic cleaning of septic tanks and clearing the sewerage lines, transporting cargo within narrow streets, and so on.

International and national private organizations, involved in public private partnerships for the provision of environmental infrastructure and services, also promoted community participation to streamline the implementation and operation of their services, especially in poor urban areas. For example, the private sector facilitated community groups in Jakarta to assist in the collection of bills in slum areas, where it is difficult for outsiders to perform this job. Community services can also

be integrated into the overall management. For example, door-to-door collection of solid waste could be integrated into the overall collection and disposal of solid waste, or in recycling activities, such as sales of inorganic recycling materials and production of compost from organic waste. Similarly, they can be a part of large transport companies and can collect goods from central points and make deliveries to shops located within these dense areas, through the use of nonmechanized vehicles.

The local governments and NGOs also started strengthening community groups to play an effective role as watchdogs. Community groups can check the level of service and price as per agreements. These groups can also monitor the level of pollution and its sources. Some community groups, including academia and researchers, can scientifically monitor the level of pollution. They can also monitor the discharge from major polluters, including industries, transport, and households. The scale of monitoring can be as small as simple surveillance or putting peer pressure on neighbors to dispose of their waste properly. Or, it can be as large as checking the disposal of toxic waste in the sea, or monitoring the discharge of polluted water into streams and rivers.

National and international agencies also started involving community organizations in awareness raising for environmental conservation and protection. Public awareness can help reduce waste, facilitate proper disposal, reduce the consumption of water, reduce the number of car journey, increase the walking and cycling journeys, and so on. In the poorer sections of the communities, public awareness can help induce hygienic behavior, as water supply does not guarantee the reduction in water-related diseases, unless proper health and hygiene practices, including washing of hands, are adopted by communities, especially children.

Public awareness is also essential for coming to a consensus and decision making on the provision of environmental services and infrastructure. The community may agree to give the private sector a role in the delivery of services, if they are appraised of the limitations of the public sector, advantages of changing the role from public sector to the private sector, and measures, including the role of the community, for checking the level and price of services. Similarly, consensus can be built through public awareness for difficult issues, such as the construction of landfills or using incinerators for proper waste disposal.

Case Studies

Reforms to promote decentralization, private-sector participation, and community participation are quite new and, in many countries, are still in their early stages. Furthermore, in many countries, these reforms aim at improving overall urban governance, and not particularly environmental management. Hence, it would be unfair to conclude the outcome of these reforms, and their impact on urban environmental

management. Nevertheless, it is important for environmental managers and policy makers at local and national levels to review the progress of the reforms and their impact on urban governance in general, and on urban environmental management, in particular. This analysis can highlight various aspects, namely, whether the reforms are working well and why? If some reforms are not working well, why are they not working? What lessons could be generalized, and what reforms, in which context, can be replicated in other geographical or institutional locations?

To conduct that review, based on the fact that most of the reforms are new and essential information is not available, one of the practical options is to analyze case studies, focused on different environmental services and infrastructure at different geographical locations. This may help to identify with initial lessons, which can be used to improve future road maps for better urban environmental management. Some case studies have been analyzed and their summary is presented in Table 3. The case studies are divided by sectors (water, waste, and air), instead of major types of reforms (decentralization, private-sector participation, and community participation) because for urban environmental management, a combination of various reforms is more useful. Five cases are focused on solid waste management, five on water utilities, and four on urban air quality management. Cities of differing sizes and communities of different socioeconomic characteristics have been selected. These case studies give fair coverage to the important subregions and major countries of Asia and Pacific region. They also cover the roles of the public sector with respect to decentralization, private sector with respect to private-sector participation, and communities with respect to community participation. However, this coverage does not necessarily mean to generalize the lessons of individual case studies at this stage. Nevertheless, these lessons could be applicable within the same country and subregions, and the reforms may have some potential for transferability to other countries and subregions, if appropriate modifications could be incorporated to reflect the variations in socioeconomic and geo-political conditions.

Solid Waste Management

Solid waste management traditionally has been the responsibility of local governments in most of the countries studied. Furthermore, this service can be easily divided into the value chain, such as street cleaning, door-to-door collection, transportation from transfer station to final disposal site, various forms of disposal including landfill and incineration, recovery of energy from landfill and incineration, recycling of inorganic recycling waste, and composting from organic waste. Different actors can be involved at different levels, and in many places formal and informal small- and medium-level private-sector participation, including community enterprises, are involved. The current reforms have further strengthened the roles of the private sector, community enterprises, and government, as evident from the case studies (see Table 3).

Table 3
Urban Environmental Reform in Asia: Summary of Case Studies

Country / City	Targets and Elements	Outcomes	Challenges
Solid waste management China / Macao	Solid waste—private-sector participation (PSP)	Since 1992, private sector has managed solid waste successfully.	Appropriate user charges need to be introduced to support the cost of services.
Bangladesh / Dhaka	Waste collection—community participation (CP)	Since 1987, community enterprises are involved in door-to-door collection of waste.	Efficiency and effectiveness is hampered because of low levels of investment and technology.
Malaysia / Kuala Lumpur	Solid waste—PSP	A private company is responsible for the management of solid waste for 72,263 km ² .	The user charges issue has political and social implications.
Cambodia / Phnom Penh	Waste collection—PSP	A private company was given a 57-year franchise-contract in 2002.	Urban poor are often not able to pay the relatively high fees.
Thailand / Nonthaburi	Recycling—CP	The municipality collects and sells the recycling waste and divides the earnings.	The success was mainly because of the political will of the current administration
Water and wastewater China / Macao	Water and wastewater—PSP	A good quality drinking water at consistent pressure 24 hours a day	A uniform tariff for all may not be a viable or efficient option for resource location.
Malaysia / Johor Bahru	Bulk water supply—PSP	The bulk water supply capacity had increased by 75% within 30 months.	The issue of water supply source, having cross-provincial implications, is not solved.
Pakistan / Sindh Province	Water & sanitation—CP	More than 500 new and rehabilitated water supply and sanitation schemes are working.	The decentralization of local governments had a negative impact.

(continued)

Table 3 (continued)

Country / City	Targets and Elements	Outcomes	Challenges
Philippines / Manila	Water & sanitation—PSP	Services improved considerably in terms of quality and quantity.	Regulatory body was not in place resulted into arbitrations and tariff hike.
Pakistan / Karachi	Sanitation in the slums—CP	104,917 houses were covered for sanitation services with a total of 7,256 lanes.	The city government needs to provide wastewater collection and treatment system.
Urban air quality management Thailand / Bangkok	Air quality—PSP	Sky train and underground train systems are in place. SO ₂ and NO ₂ are controlled.	Political will and public awareness were important in implementing critical decisions.
Japan / Kitakyushu	Industrial pollution	A dramatic success through strengthening of local regulations and institutional capacity.	There was enormous support from the national government to the local government.
Indonesia / Surabaya	Air quality management	Execution of the Blue Sky Programme to control and monitor air pollution	Intercity issues are not yet resolved, as daytime traffic in Surabaya is very high.
China / Dalian	Industrial pollution	Industrial relocation as old factory buildings were demolished and waste was cleared.	Centralized or one party governments can implement difficult decisions.

Source: Chang, Memon, & Imura (2004); Memon (2001), (2002a, 2002b); Memon, Kleiss, Imura, & Shirakwa (2004).

The government is strengthening its role as regulator, and the private sector, including community enterprises, is improving the quality of service, not only through investment but also by learning about the management of public services. However, one of the critical issues in solid waste management is levying charges on residents. As evident from the case studies, this has been a difficult task. Awareness raising and political will are vital in making this difficult decision. The government can build the trust of communities to increase their willingness to pay by showing them the efficiency and efficacy of the services. The government can also strictly monitor the progress of the private sector and clearly show that funds for solid waste management would be utilized efficiently. Government subsidies may also be appropriately utilized to improve the level of services in poor urban areas.

The Malaysian case is a good example of how traditional small-scale enterprises can be put under one umbrella to cover larger areas and improve the collection rate. This setup improves the efficiency of resources, waste collection schedules, and motivation for further investment in new types of equipment. This might be a useful example for Dhaka, where scattered community enterprises are involved in door-to-door collection; however, overall, solid waste management remains a challenge. Incentive mechanisms, as in Nonthaburi, may be useful to improve the rate of recycling. Different types of contracts may also help to improve services. Franchise contracts, which provide motivation for the private sector, may be helpful in Phnom Pehn, where willingness to pay direct charges is very low.

Water Utilities

Deregulation and private-sector participation is an increasing trend to improve the coverage and quality of water utilities. Decentralization of local governments helps local governments speed up this process, as now local governments are becoming directly accountable to their voters for these basic services. This opportunity should be thoroughly utilized, and proper planning and implementation of private-sector participation is required to avoid failure. For example, the Manila case clearly shows that if appropriate capacity, including regulatory body, were in place, the success rate could be higher. In Johor and Macao, the issue of raw water is not yet solved to the best social interests and can lead to conflict, resulting in either higher prices for water or disconnection of water sources. In many countries, the local private sector was not well established to invest and manage water utilities. Therefore, the international private sector was invited, which is costly and has a high risk of foreign exchange devaluation, as was seen in the case of Manila. Furthermore, it is argued that unlike solid waste management, water supply and wastewater are hard to break down into the value chain. Hence, water utilities require bulk investment and could be natural monopolies. This may lead to higher prices and lower quality service, if regulatory bodies are not effective. Furthermore, social dimension and affordability is very important, as water is a basic need and cannot be argued completely based on the free-market theory.

For community-based services, it is essential to foster appropriate community participation and to provide the necessary financial, human, and institutional resources. In Pakistan, institutions were strengthened to implement community ownership and maintenance across the board throughout the province. However, with the current decentralization, the Public Health Engineering Department was divided across the districts and towns. This division of a provincial body, without careful integration of the previous reforms and availability of appropriate resources for the new district- and town-level organizations, has led to a repeat of the old system where only engineers used to make the decisions. The success of community-based services also depends on its integration within the overall services, as the sewerage system in Orangi (Karachi) is very useful for sanitation and conveyance of wastewater but requires integration with the city wastewater treatment system to maximize the benefits.

Air Quality Management

Management of air quality traditionally was under the control of national governments in most of the countries studied, until recent reforms where local governments were given authority to implement local regulations and take appropriate actions to improve the situation. The Bangkok Metropolitan Authority, for example, set a series of targets (see Table 3) and brought about considerable improvements in air quality. Bangkok is a capital city, which has numerous resources in comparison with other cities. However, there are other similar cities in the region, where air quality has not comparatively improved despite the implementation of similar reforms. This case demonstrates the political will, commitment, and coordination of local and national governments. Surabaya in Indonesia has also actively initiated programs to improve air quality; however, intercity issues are very critical for smaller cities where local pollution can travel from one city to another, or where residents of one city can be responsible for pollution in neighboring cities, which function as workplaces, shopping areas, or entertainment areas. Local governments may introduce local taxes to reduce pollution levels, as can be seen in Singapore and London, which levy a “rush hour tax” on vehicles.

For industrial pollution management, Kitakyushu³ in Japan and Dalian in China provide diversified experiences. In Kitakyushu, the city government, under increasing pressure from the local community, negotiated with industries for voluntary agreements at the initial stage. The city government also benefited from the decentralization of power from the prefectural government for pollution control measures. However, most of the success for pollution control was because of support from the national government, and to the affluence of the city. Nevertheless, cities with low income and with lesser national support may also bring about considerable improvements if they spend their scarce resources effectively and efficiently. In Dalian, it was comparatively easy to relocate and modernize the industries because of the

city's centralized system. In other countries, this takes a lot of time and resources to implement such difficult decisions.

Lessons Learned

Urban areas across Asia increasingly face environmental management challenges because of rapid increases in population, economic growth, and industrialization. The objective of current reforms in Asia is to bring about improvements in overall governance, including in urban environmental management. These reforms have been more successful in some places than others. The analysis of case studies presented here suggests four vital lessons from the experience of urban environmental reforms in Asia to date:

1. *Combination of reforms.* Implementation of only one type of reform, for example, decentralization, may not improve the quality of environmental services and protection, unless it is combined with other reforms, such as increased private-sector and community participation.
2. *Capacity building.* The success of reforms depends on the capacity of the stakeholders. The government can perform an effective regulatory role if it has sufficient capacity to do so. Similarly, private-sector participation and community participation can also work well if they are capable of performing the identified tasks. Hence, the capacity-building process should be in line with the reforms.
3. *Diversified characteristics.* Even within the same city, there can be diverse socioeconomic characteristics, needs, and solutions. Some urban areas may be poor, whereas others are more affluent. Affordability, willingness to pay, community participation, and lifestyles may also be different. Hence, implementing the same type of actions across the board may not be very helpful. Good research and extension could help to modify the initiatives and programs in accordance with the characteristics of different areas within the city. Cost recovery for the private sector is also a very important challenge when providing services in poor urban areas. For governments, the efficiency of subsidies depends on careful assessment of allocation.
4. *Reforms are not a means to an end.* It is evident that similar environmental reforms were introduced in many cities; however, the results differed because of differences in the political will and commitment of stakeholders, including national and local governments, the private sector, and communities.

Reforms in good governance continue in many Asian cities. As a key part of these efforts, many initiatives are being introduced to improve urban environmental management and services. Learning by doing can help policy makers, and their private sector and community partners, improve the efficacy and impact of these reforms, including addressing the important environmental challenges associated with continued rapid urbanization, industrialization, and growth.

Notes

1. The United Nations, in agreement with all the member countries, has set Millennium Development Goals (MDGs) to improve living standards and eradicate poverty, disease, child mortality, illiteracy, and gender imbalances. Goal 7 (Ensure Environmental Sustainability) aims at increasing access to safe drinking water and basic sanitation, and improvements in living standards of slum dwellers. It is targeted that the number of people without access to these basic needs will be halved by 2015, and there will be improvements in the lives of slum dwellers. Most of the other goals, including eradication of poverty, diseases, child mortality, illiteracy, and gender imbalances and developing global partnerships are closely linked with Goal 7.

2. Private-sector participation is taking place in different forms or with different names. Public private partnership is the most common form, where private sector and governments form partnerships to provide a public service under various contractual agreements (Figure 2). In some countries it is known as “marketization” or commercialization. Deregulation of public services does not necessarily mean private-sector participation; however, deregulation can lead toward direct or indirect private-sector participation. Indirect private-sector participation retains public sector management but floats shares in the stock market. *Corporatization* is also a term for deregulating services from direct control by the government and making these services run on a commercial basis.

3. In Kitakyushu, the motivation for the local government to act for improving SO_x and dust, in particular, goes back to protest movements carried out by women’s groups, under the slogan “We want our blue sky back” in the mid-1960s. Such campaigns increased awareness among people who were silent for a long time regarding the negative aspects of environmental pollution. Despite pressure from polluting enterprises, these women’s groups petitioned and challenged the local government with their own studies on air quality. In other cities in Japan such as Kawasaki and Osaka, resident groups had many confrontations with polluting enterprises and the local government. The antipollution movement had a lot of political repercussion in those cities. The motivation for local political leaders to carry out antipollution measures had some political consideration because of the leftist political party’s active environmental agenda and ongoing public awareness and protests for environmental improvements. This provided motivation to polluting enterprises to seriously cut emissions. The situation led to voluntary agreements (March 1972 and January 1977) between polluting enterprises (48 companies, 57 factories) and the local government to cut emissions and implement pollution control measures. These two agreements were made in groups; however, individual agreements were made at other times. The following countermeasures for air pollution were taken by the city government:

- strengthening of local regulations and enhancing institutional capacity
- fuel quality improvement and fuel substitution
- technical guidance and technology enhancement in the manufacturing process
- change in industrial structure
- financial mechanisms: subsidy measures
- enforcement
- public awareness

To support countermeasures, the institutional capacity of the environmental department was enhanced, in terms of number of qualified staff, monitoring system, and equipment. The table below shows the number of administrative and research staff since the early 1960s. Similarly, the authority of decision making for regulations and standards, and smog warnings was shifted from Fukuoka Prefecture to the City of Kitakyushu in 1970. This transfer of authority to the local body provided opportunities to act quickly and also lent a sense of ownership among the city council, administration, enterprises, and the residents. After this, the Kitakyushu Air Pollution Prevention Joint Council was established consisting of representatives from the national government, Fukuoka Prefecture, and key polluting enterprises. This council

played a key role in implementing a wide range of countermeasures. Decentralization of responsibilities within Kitakyushu City was also a key institutional measure.

Year	Status	Administrative	Research
1963	Subsection	4	—
1965	Section	8	9
1870	Division	22	17
1971	Bureau	25	21
1977	Bureau	75	45

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