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Kitakyushu Initiative for a Clean Environment: Moving towards "Sustainable Cities" in Developing Countries

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Abstract

High population density in cities and adverse environmental conditions are creating severe problems for those citizens; thus, improvements in environmental situation of cities can generate various benefits including health benefits. Sustainable urban environmental management is a necessity to cope with environmental challenges in the long run. This requires proper capacity development of local governments, which are close to the local people and also responsible for the environmental challenges. Therefore, we analyze the contemporary research and propose a framework for the capacity development. This includes building social and physical infrastructure through institutional strengthening, financial mechanism for revenue generation and incentives for private sector investment, policies and regulations, promote appropriate technology for the local needs, creating public awareness, and participation of all the stakeholders.

We present a local initiative "Kitakyushu Initiative for a Clean Environment" to show a good example of capacity development for urban environmental management. This initiative aims to bring tangible and measurable outcomes by carrying out ground-level activities in the network member cities. We discuss the two successful practices, whose experiences can be transferred to other cities, and we also discuss two pilot projects, where we are assisting municipalities in capacity development. We conclude this research by supporting that capacity development for environment should be properly planned with specific targets, like urban environmental management.

Keywords

Urban Environmental Management; Local Initiatives; Learning from Experiences

1. Introduction

Urban population growth rates are higher in developing countries than the average national growth rates. Although most of the development agencies were undertaking rural development projects to improve the living standards in rural areas, the migration towards urban centers is a continuing phenomenon in the developing countries. Therefore, the realistic challenge for development agencies is not to halt the expansion of urban centers, but to address the challenges, including environmental issues, faced by the cities.

Sustainability is a debatable term and it can be defined from the specific point of view. For development and environmental specialists, we can define this term to provide the socioeconomic and environmental services on self-reliance basis. Among these services, the sustainable urban environmental management is the biggest challenge in the developing countries requiring a lot of efforts to improve social and physical infrastructure. The investment in urban environmental services can yield higher benefits, as most of the urban environmental hazards affect the health of the people.

International development initiatives are trying to help the developing countries to meet these challenges. However, it is comparatively a recent approach to assist the local governments in place of national governments, as these are directly responsible for most of the urban environmental services. Furthermore, there is a growing trend to make local authorities independent. Moreover, now decisions are being made on demand responsive approach (DRA), to only invest for meeting the real demand from the users.

Kitakyushu Initiative for a Clean Environment also follows this trend. This initiative aims for capacity development of local governments to improve their urban environmental management. Under this initiative, various successful practices have been gathered and pilot projects have been initiated. This initiative can provide good input for development agencies to promote sustainable urban environmental management through capacity development.

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In the next section, we develop a concept of "sustainable cities" and the role of urban environmental management for moving towards sustainable cities. Then we discuss the framework for meeting the challenges of urban environmental management on sustainable basis. In the third section, we elaborate Kitakyushu Initiative for a Clean Environment. In the fourth section we conclude this paper by discussing the policy implications of this initiative and to decide about future development strategies for providing urban environmental services on sustainable basis.

2. "Sustainable Cities"

Cities are facing various challenges including socioeconomic, law and order, and environmental issues. Hence in a broader framework, all the challenges should be met on a sustainable basis to achieve the status of a "Sustainable City". For different set of issues, the sustainability could be defined differently. When we tackle any of the issues for example crime control, education for all, pollution control, or provision of water supply, we come across different definition of sustainability. As our research is directed towards urban environmental management, our selection of the definition for sustainability is focused in this direction.

Different schools of thought define sustainability from their own perspective. Environmental economics, which is assumed as the core area for defining sustainability, also defines it at four different levels of sustainability from intra and inter generation equity point of view (Turner 1993). Here on the one extreme, very weak sustainability allows to convert natural assets into man-made capital. On the other extreme a very strong sustainability does not allow removal of any natural asset. Most of the investment decisions, involving sustainability, select different discount rates to take investment decisions, as high discount rates encourage the use of natural assets but the low or zero discount rates do not encourage the use natural assets. However, Summers (1992) observes that we should carefully incorporate all the costs and benefits and should do a good cost-benefit analysis, as this is more important than routinely lowering the discount rates.

For the development agencies, definition of sustainability also varies according to the basic foundations of the agencies. For example, in the World Bank, which is more of a bank, a project is sustainable, if the economic rate of return it generates is at least equal to, the opportunity cost for project's benefits. In USAID, which is a development agency, sustainability is a program's capacity to continue to deliver services or sustain benefits after the donor's technical, managerial, and financial support has ended. Therefore, this is what we can term as the "self-reliance" from long-term perspective of a project or policy.

The other important issue is of equity, as equitable treatment of all people within a community of users us often of equal concern, and policies that redistribute resources to poorer individuals are of considerable importance in developing countries where distributions of wealth are highly skewed (Ostrom et al. 1993). Due to equity as one of the aim for the environmental services, it is difficult for private sector to manage these services on basis of the free market philosophy. Hence local governments have to play an important role to maintain the equal distribution of the benefits within the community.

This clearly suggests that for moving towards "sustainable cities", we need to address the various issues including environmental management on self-reliance basis, without depending on aid or subsidizes, and with equal distribution of the benefits. From here we can move to outline a framework for sustainable urban environmental management focusing our goal of self-reliance and equity.

2.1. Urban environmental management

In urban centers, local governments or municipalities are responsible to provide the environmental services including water supply, sewerage, and solid waste management (O'Sullivan 2000). However, this is the biggest challenge for the municipalities, as most of the services in the developing countries are either not available or run into the problems due to weak institutions and due to scarcity of the resources. Hence the availability of optimal social and physical infrastructures is crucial factor for urban environmental management.

Ostrom et al. (1993) suggests that social infrastructure consists of institutions, which based on the people, and the patterns of regular, repetitive interactions among them transform inputs into outputs. The institutions include families, private firms, government agencies, local communities, NGOs, and so on. For urban environmental management, municipalities are playing a greater role; however, these institutions are not performing at the optimal levels due to various reasons. The most important aspects include the job

description for the people, and incentives and accountability to perform up to the best levels. Then either there are no firm rules, regulations, and incentives to generate revenues, and to promote public-private partnerships, or their enforcement is an issue.

Provision and maintenance of the physical infrastructure has been a long-lasting challenge for the municipalities due to financial constraints, as most of the services require the cross-subsidies and due to budget deficits the required funding is not available. A part from financial constraints, the lack of proper planning, designing, construction, and operation and maintenance also hampers the performance of the physical infrastructure. However, these problems are mainly linked with the social infrastructure.

2.2 Framework for sustainable environmental services

Capacity development for environment is essential for providing sustainable environmental services. First of all we can start with the two important aspects, viz. human resources and financial resources, available to the municipalities. Human resources, though in abundance, but lack skills and motivation to perform. The optimal human resources require proper selection criteria, on-job training, proper job description, incentives for motivation, and proper accountability.

The financial resources can be optimized by cross-subsidies from taxes, regulations to generate revenue, and incentives for pub-private partnerships. There is a vast debate on user charges to cover all the costs instead of cross-subsidies from the taxes. However, for pollution charges, Tietenberg (1999) suggests that pollution tax may be regressive as higher prices hit poor people proportionately more, who spend all their money, then the rich people, who save some of their money. He recommends that subsidies are progressive to maintain vertical and horizontal equity. Similarly, private firms cannot adapt the same rules of business for the public services, and require a different set of incentives to invest into these services.

Secondly, most of times there is lack of proper planning, designing, construction, and operation and maintenance. The planning and designing usually do not keep up with the real demand. Hence sometimes these services are underutilized or other times, services are not enough to meet all the demand. Then there are problems in construction, and operation and maintenance, which are mainly related with corruption and inefficiency of the staff.

To improve these issues, one of the most recommendable ways is to promote decentralization for municipalities, including their tax collection and environmental regulations. Uphoff (1997) concludes that successful decentralization will move in a dialectical relationship with creative committed and effective central government action, supporting greater capacities in the public, private and voluntary sectors at lower levels.

Then for planning, many of the traditional policy makers support blue print; however, a learning process or participatory approach is flexible with changing definitions of roles, obligations, procedures and methods, collegial authority, and free lateral communications (Chambers 1993). Furthermore, the World Bank Conference on community water supply and sanitation in 1998 emphasized that a demand responsive approach (DRA), institutional rules and a relationship between DRA and sustainability are the main issues for achieving effective investment decisions (UNDP-World Bank 1998). Hence the institutions should not stick down with blueprint style, as the growing environmental challenges coupled with public awareness can change the demand for the environmental services.

Decentralization and learning process approach will help the municipalities to make rules for community participation and for public-private partnerships. Here, community participation is a voluntary process by which people, including disadvantaged people (in income, gender, ethnicity, or education), influence or control the decisions which affect them, and the essence of participation is exercising voice and choice (Naryan 1995). While incentives for private sector like built-operate-transfer (BOT), built-own-operate (BOO), built–lease-transfer (BLT), or turnkey type of regulations can promote private investment and management for the delivery of these services.

Here, we can get a clear framework for the capacity development for the environment. We need to assist municipalities to improve their human resources and financial resources as well. Then we need to encourage them to adopt learning process and demand responsive approach for the planning. Finally, we need to help them to promote community participation and public-private partnerships. Based on this framework, we analyze “Kitakyushu Initiative for a Clean Environment.”

3. Kitakyushu Initiative for a Clean Environment (KICE)

KICE was adapted at the 4th Minsterial Conference on Environment and Development in Asia and Pacific (MCED), coordinated by United Nations the Economic and Social Commission for Asia and the Pacific (ESCAP) in Kitakyushi city during year 2000. Kitakyushu city has a successful history of overcoming urban environmental challenges and the city government is now helping other cities in the region for sustainable urban environmental management. To take an initiative for the cities located in Asia and Pacific region, KICE is intended to act as a priority mechanism in the implementation of the "Regional Action Program for Environmentally Sound and Sustainable Development, 2001-2005," specifically in relation to environmental quality and human health. It aims to work in conjunction with local initiatives and commitments, including such activities as Local Agenda 21, as well as all societal actors, including national governments, donor organizations, academia, and local communities.

KICE mandates the achievement of measurable progress in improvement of the urban environment in major cities in Asia and the Pacific, mainly through local initiatives aiming at control of air and water pollution and minimization of all kinds of wastes. This will be achieved through the use of all available technical, institutional, regulatory, and participatory measures. Moreover, KICE aims to improve the capacity of local governments, as those are the closest governments with the people and also having primary responsibility to provide environmental services.

KICE aims to promote ground-level activities to achieve tangible improvements in urban environmental quality. The initiative also encourages the transfer of successful practices through inter-city cooperation, learning from experiences of cities with the aim of strengthening local initiatives and enhancing partnerships, with these experiences to be shared through an action-based Network. KICE seeks support from national governments to provide the setting for socioeconomic and technological conditions, legislative infrastructure, and bilateral/multilateral donor assistance; policies on sustainable development, collaboration with existing international initiatives; and promotion of multi-stakeholder partnerships.

To implement this initiative, Institute for Global Environmental Strategies (IGES), Kitakyushu office is a providing coordination and secretariat services. Furthermore, this initiative is different from other similar initiatives, as it gets directly involved with the local governments and other stakeholders to carry out ground level activities, networking of cities, collection of successful practices, and information dissemination.

3.1 Successful practices:

Under KICE, we are collecting the successful practices in urban environmental management to provide practical examples for the network cities to improve their capacity to meet their own challenges. The successful stories are being collected from Japan, China, Korea, Indonesia and other countries. Here, we will present some of these practices.

Kitakyushu city: This city in Japan has a rich experience in overcoming all the urban environmental challenges; however, here we are only presenting its experiences in controlling SO_x pollution. Kitakyushu City was one of the most polluted cities in Japan during 1960's and early 70's due to the industry related pollution such as high sulfur oxides concentrations and dust fall. Since then drastic measures were taken by the city to improve its air quality. As a result, Kitakyushu City could enjoy high economic growth as well as the improvement in air quality in later years. Recognizing the achievement of Kitakyushu City, it was awarded Global 500 Award by UNEP in 1990.

Fig. 1 SOx concentration and dust-fall

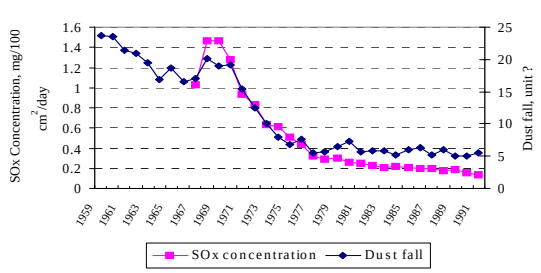
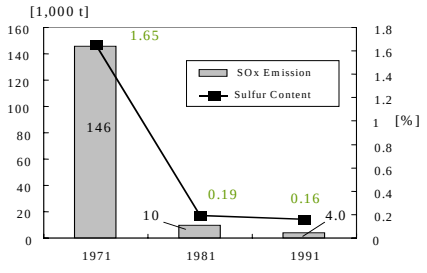


Fig. 2 SOx emissions and average sulfur content of fuels



The countermeasures against the air pollution by the city government can be divided into strengthening of local regulations, enhancing institutional capacity, fuel quality improvement, fuel substitution, technical guidance and technology enhancement in the manufacturing process, change in industrial structure, factory relocation from residential areas, and financial mechanisms including subsidy measures. Due to limitation of space, the details of these experiences will be presented in the conference.

Dalian city: This city in China is growing up rapidly and due to its economic growth, there were negative environmental impacts. However, due to effective urban environmental management, there are considerable achievements in air and water quality. The counter measures against the pollution control include policy and regulation, and administration for relocation, removal, merger, scaling down, and selling of the enterprises. The government also improved financial policies, technology and monitoring to control the industrial pollution.

Table 1 Industrial pollution control

Air (Decrease in air pollution emission density (1996-2000))	
Decrease amount/rate of gas	4.7 billion m^3; 96%
Decreased amount/rate of dust	5292 tons; 95%
Decreased amount/rate of smoke	2249 tons; 88.6%
TSP	0.222 to 0.137 (Standard is 0.2m g/m^3)
SO_2	0.060 to 0.024 (Standard is 0.06m g/m^3)
NO_2	0.070 to 0.029 (Standard is 0.08 m g/m^3)
Natural dustfall	20.0 to 17.2 (ton/km^2 per month)
Water quality	
Decreased amount/rate of industrial waste water	20.059 million tons; 52%
Decreased amount/rate of COD	40 thousand tons; 93.6%
Decreased amount/rate of petroleum	3137 tons; 99%
Oils	0.048 mg/L (1995) to 0.027mg/L(2000)
Inorganic nitrogen	0.198 mg/L(1995) to 0.105mg/L(2000)
Solid waste	
Decreased amount/rate of solid waste	1.45 million tons; 94.2%
Natural Conservation	
Green areas coverage	5.5%(1992) to 40.5%(2000)
Green area per capita	$3m^2$(1992) to $8.5m^2$(2000)

3.2 Pilot projects

Under KICE, we are carrying out the pilot projects to improve the capacity of local governments for meeting overall environmental challenges. The cities are only provided with a small grant through ESCAP and IGES, in collaboration with other experts, works on capacity building and also in the areas of public awareness and community participation. We are citing a two pilot projects over here.

Nakhon Ratchasima (Korat): This city in Thailand is facing the sever problem of water quality in Lumtakong Canal, when it passes through the municipality boundaries. There was solid waste in the canal, and the communities, living on the banks of the canal, discharge their wastewater directly. To address this problem, the municipality started public awareness campaign for the cleaning of the solid waste from the canal. To control the quality of the wastewater, they have constructed simple water treatment plants in the two communities, where BOD level has been changed from 188 to 66. The municipality tries to compost the organic solid waste, collected from the canal. KICE assist this city in community participation, public awareness, construction of simple wastewater plants with improved technology, and advice on overall solid waste and composting.

Nonthaburi city: This city in Thailand is facing a challenge for solid waste management. Hence their aim is to minimize the solid waste by maximizing the separating recyclable waste at source. Therefore, two communities have been selected and public awareness campaign has been started. These communities are being provided separate bags to collect recyclable materials. Municipality arranges the collection of the recyclable materials and then sells those to the recycling shops. The earnings are being divided equally between collectors and the communities. This will encourage communities to manage their recycling materials on sustainable basis. For other solid waste, the municipality charges minimum of 20 bhat and it increases with the weight of the waste. The municipality composts the waste, from the falling trees and from fruit markets, and uses the composting material for public parks or sells those fertilizers. The municipality aims to increase recyclable materials up to 30% of total waste and decrease the solid waste by 20%. IGES is assisting the cities for their capacity building to meet these targets.

Table 2 Solid waste and recyclable materials in two communities

Community	March 2002			April 2002		
	Solid waste	Recyclable materials	Recyclable materials	Solid waste	Recyclable materials	Recyclable materials
	kg	kg	%	kg	kg	
Phibulsongkram	27135	4384	16.2	23751	2375	10.0
Suanglang Muang	5597	348	6.2	3915	436	11.1

4. Conclusion

This research shows that urban environmental challenges can be tackled successfully with a proper capacity development. The main focus should be the local governments, which are responsible for most of the environmental challenges. The capacity development includes the institutional strengthening, decentralization from the national governments, regulations, technology to suit local needs, and financial structure to support the physical infrastructure with policies on the revenue generation and on the private investments. Furthermore, we can observe that all the stakeholders have to play a vital role. Hence public awareness and community participation should be at the forefront for effective urban environmental management.

Local initiatives like KICE can bring substantial gains with limited resources, if these are targeted in a specific direction, like urban environmental management in this case, to bring tangible and measurable outcomes through ground level activities and not just by only advising the local governments. Hence, proper fieldwork with well planned framework is essential to make a difference for development of cities in the developing countries, which are facing enormous challenges.

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