

# Environmental Management Measures in Developing Countries and Bangladesh Scenario: A Quest for Environmental Protection and Management

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## Abstract

*This paper stresses incorporation of regulatory, economic and moral suasion as environmental management measures (EMM) for protecting and enriching the urban environmental management in the cities of developing country with particular focus to Bangladesh. Review shows that cities in developing countries still lack the institutional framework and major accountable for natural resource loss and environmental degradation. Based on the reviews of journals, reports and laws, this article depicted except few developing country cities, urban environment of the most cities are at stake. Analysis of this paper highlighted that the application of EMM in Bangladesh is still in the formative stage without structured framework. Finally the paper has emphasized incentive-based policies according to EMM for managing natural resources such as water, food zones, hills and reducing vehicular and industrial pollution is urgently needed for Bangladesh.*

**Keywords:** environmental management measures, pollution, institutional framework, Bangladesh

## Introduction

Three environmental problems that fare prominently in economic analyses are: (i) pollution; (ii) destruction of natural resources and (iii) Free-riding of environmental resources. According to economists, pollution is a result of non-internalization (or non-counting) of certain costs that take place in the course of production and consumption. This idea is generalized by the *Theory of Externalities* (Amin, 2004). Similarly, destruction of natural resources (e.g. deforestation and dumping of wastes into fresh water bodies) takes place because these resources are seen as

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*open-access resources*. Likewise, free-ridings abound with respect to environmental resources because many want to use resources such as clean air and water, wetland/lowland and green space, etc. without paying for them. Economists call these goods: *Public Goods*. The problem with public goods is that these do not have exclusionary characteristics, i.e., one cannot be conveniently excluded from its use even s(he) does not pay for its use. As a result, natural resource loss and environmental pollution is common in most developing countries.

To deal with the above problem most developed countries have shown their success using environmental management measures. Recently Asian developing countries Thailand, Vietnam and Nepal also succeeded in reducing environmental pollution particularly in the transport sector. In this paper authors have attempted to analyze the environmental management measures (EMM) in developing countries with special focus to Bangladesh. Based on the insight of environmental economics, EMM derives an analytical framework for management of the urban environment. In the analysis of EMM, Amin (2007), illustrated that three elements invariably influence the human mind: *fear*, *material* (economic/financial) interest, and a *moral & ethical sense*. Policy instruments for influencing human behavior according to these elements are, respectively: regulatory, economic and suasive instruments. Each and every citizen of a society or country know that they are subject to some laws, rules and regulations and that they may be prosecuted if those are disobeyed or ignored. The command and control (CAC) or regulatory measures indeed target the fear element of human mind. This paper first discusses about the concept of environmental management measures (EMM) followed by an analyses of two case studies from the secondary data sources to show how two cities from the developing countries have significantly minimized their emerging pollution threat using some of the EMM tools. Finally the paper highlighted the existing status of various EMM found in relevant literatures, official documents and laws in Bangladesh and concluding part summarizes the paper.

### **Concept of Environmental Management Measures**

Environmental management measures (EMM) are prevalent in most developed countries to reduce pollution. These measures mainly comprise of three basic components, which include regulatory instruments, economic instruments and suasive measures and have helped to prevent further environmental degradation and to improve the quality of life of the people. Amin, (2007) has illustrated three sets of environmental management measures (EMM):

1. **Economic Instruments (EIs)/ MBIs:** While Subsidy (to give incentive) and taxation/pollution charges (to create disincentive) are

the two fundamental policy instruments, market-based economic instruments include: (i) (Emission) *Charges*; (ii) (Abatement) *Subsidies*; (iii) Deposit-Refund System; (iv) Market Creation-Tradable/Transferable Emission Trade Permits, Market Intervention and, Liability Insurance and Financial Enforcement.

2. **Regulatory Instruments (RIs)/ CAC:** comprising of (i) regulatory forms such as laws, licenses, permits, registration, administrative guidelines directives, codes of practices; (ii) Regulatory Instruments: Emission of effluent standards, Environmental quality standards, Product controls, Process and equipment standards, Planning and building controls, Extraction restrictions.
3. **Moral Suasion:** Basic principles of moral suasion measures are: (i) reliance on voluntary compliance by polluters motivated either by the threat of adverse publicity or the prospect of favorable publicity; (ii) Raising awareness through education for environmental protection.

EMM, as enforced in the developed countries, are primarily based on the application of theories associated with (i) externalities, (iii) open-access resources, and (iii) public goods (Amin, 2007). Failure in internalizing externalities, in ensuring property rights, and in managing public goods appropriately gives rise to environmental pollution, destruction of natural resources, and free-riding of environmental resources. Therefore, the developing countries seeking to adopt EMM must first address two major barriers: (i) limited knowledge and application of EMM, and (ii) shortage of professional capabilities and institutional capacities to apply EMM.

### **The Case for an EMM Framework for Sustainable Environmental Management**

Amin, (2007) noted two drawbacks that are depriving societies' potential gains from the use of EMM. First, the fundamental basis of EMM policy measures being in place to influence human actions is not always borne in mind in designing their use. As a result, they are not explicitly targeted to the needed behavioral change. Second, use of one set of instruments, setting aside the remaining two, would clearly mean the adoption of a partial approach because this will address only one element of a human mind or psyche. Therefore, in the absence of a simultaneous use, the policy is doomed to be partial in influencing behavior of a consumer, producer or a stakeholder.

As a consequence, it is necessary to, first, understand that a human mind is neither all about only fear, economic interest or moral sense but each element is inherently present in human intellect and inhabit together. In other words, each individual has simultaneously a fear in his psyche, an economic orientation and a sense of morality. Second, a policy

strategy for behavioral change thus needs to target each element of a human mind for optimal outcome from a policy measure seeking to influence particular aspect of human behavior. Third, as a result, use of regulatory, economic and suasive measures needs to be simultaneous as a policy package for them to be comprehensive, whole or holistic enough for appealing to all three aspects of human mind. For facilitating such a holistic approach, it is better to place all these three sets of instruments as integral parts of an EMM framework.

### **Two Cases of Effective EMM Use in Developing Country Cities**

Two relevant secondary sources data on Bangkok (Thailand) and Hanoi (Vietnam) are shown here in box 1 and 2 which comprehensively present the success of two cities of switching from leaded to unleaded petrol under the policy instruments of EMM.

#### **Box 1: Successful Switch from Leaded Fuel to Unleaded Fuel in Thailand**

The switch from leaded to unleaded fuel is a success story for several countries in Asia. Thailand's case is almost a text-book kind illustration of the use of EMM framework. Once the scientific information of leaded ingestion in children resulting significantly poorer development manifested by lower IQs came to be known in the public realm by newspaper headlines - action of *suasive measures* in EMM - the desired outcome started to work. Information was made available to public explaining what was happening and why changes should be made (public awareness campaign). As Ross observes, "such an approach was essential because it would cost money to change the refineries, and thus the cost of unleaded fuel would be more costly (although the costs of diminished intelligence due to the continued use of lead would be much greater). Convincing the people the benefits of the change was an important tool to create acceptance. That is, it was essential for people to understand that the increased cost of unleaded gasoline was less than the increased cost of diminished intelligence. This led people to accept the increased cost of unleaded gasoline\*". Thus *the regulatory measures* were used to phase out the use of leaded gas over time. *The economic measures* were used during the transition when both leaded and unleaded fuels were in use. The problem of higher cost of unleaded fuel, hence, user incentive to buy leaded gas was overcome by increasing a tax on leaded fuel (an example of internalizing the negative externality by charging for the polluting cost) and thereby making sure that unleaded fuel cost at least is not higher than the leaded gasoline. The combination of regulatory, economic and suasive measures, thus, led to a relatively quick switch from the leaded to unleaded fuel use in Bangkok.

\* William Ross, "Urban Environmental Management: Principles, Professionals Practice, and Professional Education", Regional Development Dialogue, Vol. 19, No. 1, Spring 1998, pp.143-144.

Source: (Amin, Jarusombut, Thuy and Thanaprayotsak 2006, pp.85-100); (Amin, 2007).

**Box 2: The Case of Phasing out Leaded Gas in Vietnam**

Vietnam's switching to unleaded gasoline is seen as "An overnight success\*". Thuy attributes this success to the comprehensive use of environmental management measures\*\*. The measures used to switching unleaded gasoline in Vietnam included providing economic incentives, issuing regulatory and administrative directives and charges, and launching public awareness campaign. Although an initial attempt to eliminate leaded gasoline began in 1995 with the institution of transport-related environmental regulation, it got stalled because of the concerns on the cost to switch and the fear that many vehicles in Vietnam would be inoperative for unleaded gasoline without major modification of the vehicle body and engine. Public worried they would end up paying more for the new type of gasoline. The opposing viewpoint initially got newspaper headlines and electronic media coverage, which raised issues of thousands of older automobiles and millions of motorcycles. Sobering opinion was for phasing the introduction of unleaded fuel over several years, A November 1999. CIDA funded workshop in Hanoi with participation of journalists and reporters from various national and local newspapers from all over the country and the follow-up activities are seen to had started to change the public mood on the issue. At the background of this favorable public opinion, in November 2000, the Deputy Prime Minister Nguyen Tan Dung issued the directive on "Switching to Unleaded Gasoline in Vietnam", which stated that unleaded gasoline would cease to be used by July 1, 2001. This was followed up with a workshop in February 2001 for preparing a public information plan for the switch. Posters were prepared and distributed to gasoline station in readiness for the July 1, 2001 switch. To overcome the vital constraint of cost, two economic measures introduced included the subsidy for importing unleaded gasoline and a reduction of taxes of octane importation for domestic fuel refineries. This tax reduction policy helped the Saigon Petro Company (which was earlier apprehending facing bankruptcy) to supply unleaded gasoline at a price even 100 VN lower than its leaded equivalent. The interplay of the above suasive, regulatory and economic measures allowed Vietnam to switch to unleaded gasoline use on target avoiding a lengthy and costly phase out program.

\* *World Bank's Energy Sector Management Assistance Program (ESMAP), An Overnight Success: Vietnam's Switching to Unleaded Gasoline". Report 2/027.*

\*\* *Trinh Thi Bich Thuy, Environmental Management Measures for controlling Vehicular Air Pollution: Case Study of Hanoi, Vietman. AIT master's thesis, p.77.*

*Source: (Amin, Jarusombut, Thuy and Thanaprayotsak 2006, pp. 85-100); (Amin, 2007).*

These two cases clearly reflect the successful outcome of EMM in two cities, where simultaneous application of RIs, EIs and SIs brought enormous success in combating air pollution particularly by vehicular leaded gasoline. These two cases are clear examples for other developing cities for adopting such initiatives.

## **Environmental Management Measures in Bangladesh**

### **Open-access Resources: Laws in Bangladesh**

Environmental management measures in Bangladesh are in the form of different laws. The lack of detailing of these laws is causing non-application of EMM. However, to deal with open-access natural resources, the government is reviewing the existing laws and trying to enforce those laws strictly. Adoption of National Environment Policy and formulation of National Conservation Strategy and the National Environment Management Action Plan are some of the measures undertaken by the government to integrate environment with development in a policy framework under EMM. The Environmental Conservation Rules, 1997; The Environmental Conservation Act, 1995; The Forest Act 1990; The Protection and Conservation of Fishing Rules 1985; and The Bangladesh Wildlife Preservation Act, 1974 deal with open access resources in Bangladesh. The government declares an area as an ecologically critical area (such as; forest land, wetland, mangrove, national park, animals' habitat, archeological site and so on) and defines what operation shall not be done including no change in land use in that area. Of course the mere declaring of an area as critical is not enough for stopping the destruction of the natural resources. Therefore, cutting hills for filling up newly constructed low-lying housing areas became an emerging phenomenon in low-lying areas of Greater Dhaka, Sylhet and Chittagong. Growing industries within the whole country en masse are polluting surrounding areas without considering the consequences of environmental risks. At some instances there are actions from law enforcing agencies for stopping hill cutting, arresting the environmental law violators and sending them to jail. The present available laws and their weaknesses regarding environmental preservation in Bangladesh are given below:

Table 6. 8 Weaknesses of RIs and EIs in Existing Rules and Regulations

<b>Laws</b>	<b>Weaknesses</b>
Dhaka Metropolitan Development Plan 1995-2015	DMDP comprises (i) Structure Plan (ii) Urban Area Plan and (iii) Detailed Area Plan (DAP). DMDP does not provide detailed guidelines on flood zones, agricultural land and water bodies. As the DAP is still incomplete, people of DMDP area are uncertain about their future land use, particularly regarding flood zones, retention pond and wetland/lowland use in Greater Dhaka.

Laws	Weaknesses
STP - Strategic Transport Plan, 2005-2025	This plan is mainly about future transport management for Greater Dhaka. There is a lack of details about the plan, and yet now there is no sign of its implementation.
Environment Conservation Act 1995	It emphasizes mainly on industrial and transport pollution control. Punishment for violation of 'Environment Conservation Act 1995' is imprisonment for a term not exceeding 5 years or with a fine not exceeding taka only one hundred thousand or both. Thus these laws could not make any significant positive changes regarding environmental pollution and protecting natural resource loss from illegal grabbing. For example, compared to the penalty of rule violation, establishing an Effluent Treatment Plant (ETP) to mitigate industrial pollution requires huge investments which make it more likely to violate the rule than to comply by it.
The Natural Water Body, Open Space, Park/Play Ground Protection Law, 2000	There is no gazette notification of natural water bodies. The definition of 'water body' is highly debated among different stakeholders. Under the loopholes, the private real estate developers implement their projects in low-lying areas. However, in Bangladesh Environment Conservation Act 1995 amended in 2010 clearly defined 'water body'. Punishment for violation imposes an imprisonment for a term not exceeding two years or a fine not exceeding taka only two hundred thousand or both which is very insignificant to stop violation.
Real Estate Development and Management Act, 2010.	The ordinance focuses on developers' irregularities of plot handover, registration and land development which are not related to the losses of ecologically critical areas and have no punishment provision for this.

*Source: Review of the different laws; (adapted and modified from Alam, 2011; Haque, 2004).*

### **Government Actions for Defining Property Rights**

There is a lack of proper maintenance of natural resources in Bangladesh due to the policy gaps regarding property rights. Whatever policies are present are either poor or do not have any implementation at all. To stop the destruction of natural resources 'enshrining property rights' are necessary which is still not that common in Bangladesh. In some cases, individuals are given rights to take care of the resources like leasing of water bodies, or parts of water bodies, hills etc.

It appears that use of EMM in Bangladesh is mostly the Command and Control type, which has been taking its systematic root in the last few

years. Almost all rules and regulations are in the formative stage and not distinct as those in developed countries and not even like newly developed countries in Asia. In most cases there are existences of 'Clearance Certificate', 'Permission' and 'Restriction' type documents and 'order' that are available to permit or ban the use of the natural resources.

### **Government Levying Pollution Charges and Giving Subsidies as EIs**

To take prompt legal action against environmental pollution, the government has recently set up '*Environment Courts*'. The Environment Conservation Rules 1997 has also been passed by the Parliament. The Department of Environment (DOE) is taking measures to carry out surveys on identification of polluting industries, river pollution and automobile pollution to protect natural resources.

There are no direct structured EMM for pollution charges on the basis of effluence discharge or emission trading in the country. But, punishments like, arrest and other forms of actions (e.g., fines for emitting black smoke from vehicles, cancellation of documents,) are being practiced for controlling pollution. In addition to high value on fuels, there are high import taxes on the three wheeler autorikshaws for sound pollution, high charges on diesel, restriction on the import of leaded petroleum are some key examples of EIs. As a new measure, the government has introduced a charge on the number of guests exceeding a certain limit in the feast of ceremonies to restrict resource consumption and waste generation. In addition, there are also high taxes for non environment friendly goods. Fines are being imposed on any shops, restaurant for their polluting behaviors.

### **Subsidy**

Subsidies for environment friendly goods and low pricing on natural gas promote uses of such goods in Bangladesh. Strong incentive based programs such as tax relief for less polluting mode of transportation; tax rebate, tax holiday, for environment friendly entrepreneurs and tax exemption for importing cleaner technology are still not prominent in the country.

In recent years **the government** has introduced Compressed Natural Gas (CNG), the price of which is much less than other fuels. Financial institutions have come forward by providing bank loan for importing less polluting CNG run vehicles.

### **Regulatory Instruments (RIs)**

The Environmental Pollution Control (EPC) Ordinance of 1977 was repealed in 1995 when the Environmental Protection Act, 1995 became



effective on February 16, 1995. This was an act passed by the Parliament of Bangladesh to provide for the conservation, improvement of environmental standard and control, and mitigate the pollution of the environment. The act led to the creation of the Department of Environment (DOE) headed by a Director General. This act covers the following two important issues:

1. Environmental clearance requirement for establishing or undertaking industrial units or projects.
2. Formulation of environmental guidelines and standards for the control and mitigation of environmental pollution and the conservation and improvement of environment.

To meet the terms with the set standards regulatory instruments were introduced, such as: restriction on two stroke-three wheelers not to run in Dhaka, compulsory use of helmet, seatbelt and speed limit for risk free traveling, ban on polythene bags, strict monitoring and implementing of laws regarding vehicles older than 20 years, restriction on importing certain reconditioned cars not more than mentioned years depending on different models, use of catalytic converter into vehicle etc. In recent years government imposed compulsory construction of “Effluent Treatment Plant” (ETP) for each industrial plant for minimizing the pollution discharge.

### **Moral Suasion (MS)**

Moral Suasion is another important component of EMM that significantly contributes to reduce pollution. In this regard environmental education is incorporated at different levels of education considering impact of solid waste, air pollution and pure water on health. This is also alternatively acting as preventive health care system in the country.

Both electronic and print media plays a great role for increasing awareness regarding environmental protection. Different TV channels, newspapers and journals are playing an important role in changing the moral behaviors of the people. Different environmental groups, such as, BELA (Bangladesh Lawyer Association), Bangladesh Environmental Movement Group (Paribesh Andolon), IUCN, BCAS are also active in raising the issues in different forums. They are working for ‘Save the River Buriganga’, ‘Save Dhaka’s Wetland’, and natural resources like trees, lakes and open spaces.

### **Implementation of Regulatory Instruments (RIs), Economic Instruments (EIs) and Moral Suasion (MS) Specific to Geographical Area/Location**

Recently the government is applying some RIs, EIs and MS uniformly all over the country (e.g., ban of two-stroke three wheelers and polythene, ban of car horn on few roads to control the noise pollution). . Restriction on Hill cutting in Chittagong and Sylhet is an example of geographical area specific application of RIs.

Components of Economic Instruments (EIs) in some cases are applied to specific roads and bridges (e.g. Tongi-Ashulia, Natore-Pabna-Hatikumrul highway, Meghna-Gomoti bridges etc.,)

Other than RIs and EIs various programmes targeted to environmental sustainability have been carried out by public sectors and voluntary organizations with the help of media, TV, workshops and seminars for changing lifestyles. These are some of the examples of MS of SIs. Campaigns for family planning and some RIs are also playing significant role for changing life style such as: no maternity leave benefit for the birth of 3<sup>rd</sup> child or onward in the public sector for female employees, selling of family planning medicines with a very low price etc.. In some cases, government is providing free services for receiving family planning services.

### **Complexity in Enforcement and Compliance of EMM**

#### **Enforcement**

Thailand, which has stronger economic base than Bangladesh is recently trying to enforce some of the environmental rules and regulations on pollution control for overall environmental sustainability. Bangladesh is still in a very initial stage. People of Bangladesh still are not even fully aware of solid waste collection charge. Some rules and regulations are not clear; there are overlapping of different organizations for similar tasks, (e.g., responsibility among RAJUK, Dhaka City Corporation and Deputy Commissioner's Office (DC Office), Dhaka). Moreover there is lack of clear punishment provisions and monitoring.

As a result complexities arise in executing EMMs. For example, smoking is banned in public places, but enforcement of this regulation is very weak due to the authoritative power of different organizations on different places (Railway stations, Dhaka University TSC etc.). Lack of institutional capacity is a major constraint which results in wide spread emission of black smoke from vehicles. Moreover, there are inadequate number of competent personnel and technical support for self sufficiency

of the implementing organizations. Lack of budget and lack of coordination are also acting as a barrier to the enforcement of the EMMs.

### **Compliance**

There is poor evidence of compliance with the available environmental rules and regulations in different sectors. Violation of wetland/lowland regulations by land and housing development projects in Dhaka, Chittagong and Sylhet can be mentioned as a common example. Thus the megacity has lost 11,020.64 hectare of land from restricted areas of Greater Dhaka (Alamd and Ahmad, 2011). Relevant to this analysis Dewan & Yamaguchi (2008) showed that built-up areas have increased to about 344% from 11% in 2005 compared to 1960 in Greater Dhaka, mainly by filling up water bodies, retention ponds and prime agricultural lands. This is due to the lack of strict enforcement, monitoring and evaluation of existing EMM. It can be said that the country is still an environmental degradation paradise for the violators.

Generally, mass people are still not aware of environmental pollution. Currently some environmental groups are attempting to raise the awareness and pressing the government to formulate law and to enforce them. And in reality, due to the pressures from these voluntary groups, government has taken quick decisions on some issues such as; stopping hill cutting, protecting wetland/lowland, prohibiting retention pond and lake filling by the housing project developers.

However, there is one organization 'Paribesh Adhidaptor' under Environment Ministry working at district level with insufficient personnel to oversee the compliance issues and thus has little influence in managing the environment. The Department of Environment (DOE) of the Ministry of Environment serves as the major Environmental Protection Agency in the major cities in the country. But in managing the environment the organization which is new in this type of work lacks enough qualified personnel. Sitting at the city levels it is difficult to take care of every 'open-access resources' or 'natural resources'. Because of the lack of serious attention on implementation of the existing regulations from the government the environmental issues are still not properly addressed.

### **Conclusion**

This article has briefly reviewed the two successful cases of environmental management measures in developing countries and the application of EMM status in Bangladesh with respect to different laws

and regulations. Analysis shows that the many laws and components of EMM like RIs, EIs and SIs are in a very formative stage. It is important to note that the country still lacks in institutional framework at all geographical levels for effective and efficient use and monitoring of EMM. This is needed to be urgently addressed by the policy makers for sustainable urban environmental management. And this should also be taken into consideration that for bring comprehensive result there should be a holistic use of the three major components of EMM instead of piece meal use of RIs or EIs or Sis.

Moreover it has to be kept in mind that it is crucial to design incentive-based policies according to EMM with special emphasis on managing natural resources such as water, flood zones, hills and reducing vehicular pollution. These incentive based policies should be premised on the material basis of economic, regulatory and suasive instruments. Denoted as an environmental management measures (EMM) framework, it should stimulate the *economic* element of the human mind by economic measures; play on the *fear* element by the regulatory measures: and should nurture the best part of a human mind - the *moral and ethical sense* - so that environmental protection becomes built-in in each decision and action that each individual as person or enterprise takes. This framework is seen to allow influencing human behavior towards sustainable development. Finally, environmental education program should start from primary school level. With an emphasis on Moral Suasion (SIs), EMM application may bring more effective and efficient result in environmental management, which will ensure harmonious relation between voluntary organizations, NGOs and with the government that are needed for easy implementations of EMM.

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