

## Air Pollution in Dhaka City Time to translate words into deeds

Air pollution is more than a curse. It poses serious threat to city dwellers and is a matter of everyday concern. However, no effective action to curb air pollution has been taken so far. While there have been a lot of seminars and symposia, solutions still remain a far cry, writes Hasan Zahid

**P**UBLIC exposure to air pollution in Dhaka causes an estimated 15,000 premature deaths and several millions cases of illness every year. It is estimated that if air pollution levels in the four large cities in the country were reduced to the levels outlined in the WHO guidelines of 1996, as many as 15,000 deaths, 6.5 million cases of ailment requiring medical treatment, and 850 million minor illness could be avoided annually. Emission from motorised vehicles is a major source of air pollution in Dhaka. From the health point of view, most harmful pollutants are the particulate matter (PM) and the hydrocarbons (HC).

Launched recently, the Air Quality Management Project (AQMP) has yet to start its direct programme to curb air pollution. It is still being administratively shaped up to go on for direct action. Funded by the World Bank and run by the Department of Environment under the supervision of the Ministry of Environment and Forest, this project aims at managing air quality, by means of pilot activities, with the ultimate goal of reducing human exposure to vehicular air pollution.

Urban air pollution is acknowledged to be extremely damaging to public health in Dhaka and other cities in the country. In addition, it produces negative economic externalities for investments in the country. Blackening of the city air and reduced visibility can be seen in some areas at times even with unaided eyes. Instances of choking smells and irritating eyes are common.

Uncontrolled emissions from motor vehicles have been identified as one of the major causes of air pollution. According to the available air quality data, fine particulate matters are by far the most serious pollutants. Transport contributes significantly to particulate emissions, and two principal sources within the transport sector in the city are two-stroke engine vehicles - of which there are estimated 65,000 three-wheeled public transport vehicles - and heavy-duty diesel vehicles.

The World Bank last year completed a regional programme called "Two-stroke Engine Initiative" in South Asia to address particulate emissions from two-stroke engine three-wheelers in South Asia. One of the findings was the prolific use, particularly in Bangladesh, of excess quantities of low-quality lube oil. These two factors - excess quantity as well as sub-standard quality of lube oil - are the principal cause of high emissions from two-stroke engines. Two-stroke Engine Initiative demonstrated that by using the correct amount of 2T oil (which is the lube oil manufactured specifically for use in two-stroke engines), the drivers would be able to save money and improve the mechanical state of their engines. It also demonstrated that the drivers were reluctant to part with their current practice because of their strongly held beliefs. In a follow-up attitude survey by the World Bank in May/June, 2000 in Dhaka, 640 bay-taxi drivers and owners, commuters, mechanics,

sionally manage to do field and laboratory-related works.

The government has promulgated emission standards and other regulations pertaining to in-use vehicles. These measures need further fine-tuning because merely setting off these laws and regulations cannot deal with the pollution. These need proper compliance and enforcement. The DoE announced the emission standard effective from June 1995 under Schedule 6 and 7 of the Environment Conservation Act. So far, the DoE, in collaboration with the BRTA, Metropolitan Police Metropolitan Magistracy conducted vehicle emission survey only for a short period. Virtually, no positive attitude was seen to continue such programmes from the authority, to look after the matter seriously. This is, again, a dismal picture.

It is evident from ambient air-quality measurements that the main air quality related problem in Dhaka is the particulate matter (PM-10/PM2.5) and the second is the hydrocarbons (HC). In both these categories, the principal polluters are the auto-rickshaws, tempos and commercial vehicles like trucks, buses and mini buses. It is therefore imperative that main thrust of the control measures should be directed towards these types of vehicles. High CO concentrations have been found in the traffic canyons, i.e. main arterial roads in Dhaka. High CO emissions come mainly from the passenger cars. It is rapidly becoming a community problem, early and prompt measures to control CO should be helpful in limiting its growth. Although the DoE's campaigns were not so successful, but it had some positive impacts on the drivers and owners as well as on the people as a whole. Yet, this small starter could not be continued due to reluctance and lack of commitment from the authority concerned.

World's busiest cities have become particularly vulnerable to air pollution. Dhaka is turning into one of the world's busiest cities, but the city looks quite different as it was in the pre-independent time, even in the early 1980s. Being an ever-sprawling city, Dhaka has experienced the rapid growth of numerous industrial and commercial buildings and at the same time, an increase in the various sorts of vehicles. Most of the unplanned industries within the city have not paid any heed to environment protection activity. Many old cars, along with less-combusted and two-stroke engine taxis are plying in the city roads that cause considerable air pollution. Besides, one fourth of the total population of Dhaka lives in the slums. The sub-standard mode of using bio-mass fuel causes severe air pollution and pollutes the surroundings. Moreover, areas adjacent to the city, many brick kilns have been built which also have aggravated the city's air pollution. The children, the elderly people and the pregnant women are most prone to the air pollution.

Air pollution nowadays has become one of the major environmental



Air pollution not only affects humans; it has bad impacts on tree, houses and archaeological structures as well. The Taj Mahal in India, a miracle in marble and historical monument, is facing a grave danger from the air pollution.

But we are lagging behind, since a little has been done to abate air pollution. Our eyes are only on the vehicular air pollution as because it is very much perceptible and we do suffer instantly. But what about the thousands of kilns around the country? What about the thousands of unplanned industries? Do they care for environment? Definitely, some of them obtain environmental clearance certificates from the DoE. But they never bother to comply with the terms and conditions imposed upon them. Because often there is neither any monitoring activity, nor any follow up to those from the authority. In most cases, the industries and project do not comply with the environment management or mitigation measures outlined in their environmental reports submitted to the DoE.

The activities of the AQMP to deal with a vast problem need to be expedited and should be result-oriented. They should expose themselves to the press and to the people as well about exactly what are they going to do. How many vehicles they would set right. Who are their target groups and stakeholders? How they would train drivers and aware owners. What will be the areas to cover? How much long time they would take to get city dwellers rid of the air pollution? I do not mean they would change the situation radically. But if the people have a clear idea about what AQMP is going to do, they will not expect beyond what they deserve. We must say that it is no more a matter in the policy level. What we need first is to create mass awareness. But the policy makers have often neglected this vital element. For example, most of the Dhaka people do not know about any government initiatives to combating air pollution, not to speak of the AQMP.

This Project consists of two main components: 1. Vehicle Emissions Reduction Enforcement, Standards and Control. 2. Air Quality Monitoring. For vehicle emission reduction the project aims at controlling emissions from two-stroke engine three-wheelers and diesel vehicles as first step in promoting the most promising approaches. Examples of pilot activities considered being included: a) Quality lubricant dispensing mechanism and independent lubrication for two-stroke engine b) maintenance c) Engine replacement d) Alternative fuels. The second component, the Air Quality Management, in its first phase, will establish a citywide monitoring system in Dhaka consisting of one central station and a few smaller stations. This component will include purchase of equipment, technical and professional training, laboratory management, data analysis and modelling, policy and strategy development.

The pollutants to be monitored at the central station in Dhaka are envisaged to be particulate matter less than 10 and 2.5 microns in size (PM 10/PM2.5), carbon monoxide (CO), nitrogen oxides, sulphur dioxide, ozone, non-methane hydrocarbons, etc. For both monitoring and reducing pollution following steps should be taken into strong consideration:

- ! Low smoke lubricants for use in two-stroke engines could be introduced to the exchequer in Dhaka
- ! Government could consider such introduction
- ! Positive decisions in this connection could lessen air pollution

! The authority concerned should be committed to take fruitful measures as undertaking regular automobile and industrial survey, mass awareness campaigns on national level should be undertaken through demonstration projects.

! A suitable set of standards of emissions for two-stroke engine baby taxis has to be promulgated, as current standards are not fully appropriate. The Ministry of Environment and Forest can initiate promulgation of such standards under existing laws.

! Effective enforcement of vehicle compliance to these standards has to be ensured by the government.

! Ensure proper training of drivers and owners

! The government has to ensure other stakeholder organisation like BRTA, Dhaka Metropolitan Police, DC Traffic, Ministry of Energy, Rupantarika Praktirik Gas Company (RPGCL), Auto-rickshaw Owners Association etc.

To address such vast damage on human health and environment as a whole, air pollution control activities have taken place in almost every country of the world. Bangladesh is not exception. To get rid of these bad impacts from atmospheric pollution, we need to act now and to this end we have to assess the extent of pollution load and criteria pollutants.

In our country, we need to struggle for improving the lot of the common mass, educate them and make them aware of the pollution. We need industrialisation for economic emancipation, but that kind of industrialisation, which will not harm our environment and pollute our air. We have to ensure a better environment for the present generations and leave a safer abode for the generations to come.

Main Air Pollutants	Major Anthropogenic Sources	Effect on Human Health
Particulate	Industrial activities/combustion of fuel	Toxic effects through several mechanisms including interference with respiratory tract
Sulphur Oxide (SOX)	Combustion of fuel/industrial process	Irritation in the respiratory system Diminishes lung function Aggravate Asthma
Carbon Monoxide (CO)	Transportation and agricultural burning	Toxic Easily enters into blood Causes headache
Nitrogen dioxide (NO <sub>2</sub> )	Transportation (Mostly automobiles)/combustion of fuels	Toxic Causes nasal irritation, breathing discomfort, acute respiratory problems
Ozone (O <sub>3</sub> )	Secondary pollutants derived from reaction with sunlight	Toxic Nose and throat irritation, fatigues
Hydrocarbons (HC)	Automobiles, industrial process, evaporation of organic solvents, etc	Irritates mucous membranes

gas station attendants, bus drivers, and truck drivers were interviewed, and they described the Dhaka's air pollution as very serious. Passengers took the problem more severely than the drivers, mechanics and owners. Among the stakeholders, knowledge of how to reduce smoke emissions was low.

Air pollution in Dhaka has all the components namely, particulate matter, hydrocarbons and, other gases as found in other cities. Only very limited data on air pollution are available in Dhaka. Of these, data available on airborne particulate matter (APM) are the most extensive. The Department of Environment, Dhaka Division, has measured air pollution sporadically at a few locations in Dhaka. Although the division is responsible for monitoring and measuring air and water quality, as significant environmental parameters, but due to lack of sufficient manpower, the division's small manpower have to prioritise the tasks of issuing clearance certificates to the valued clients coming from industries and companies. They can rarely and occa-

problems of the globe. Especially the congested and unplanned cities like Dhaka are the most susceptible to it. Today, not only the environmentalists, but also people in general are concerned about the adverse effects of the air pollution. The Engineers' Joint Council (USA) has defined air pollution as "the presence in the outdoor atmosphere of one or more contaminants, such as dust, fumes, gas, mist, odour, smoke or vapour in quantities with characteristics and duration such as to be injurious to human, plant or animal life or property, or which unreasonably interfere with the comfortable enjoyment of life and property". During Pre-Industrial Revolution era, greater demand for improved human lifestyle has resulted in many quick technological innovations on which the present civilisation stands. The bases of today's civilisation are the rapid industrialisation and the mechanised transports. The environment on earth now faces danger, mainly due to the humans who have not taken sustainable development into consideration.

Types of vehicles	PM 10 (per cent)	HC (per cent)
Auto-rickshaw	39.7	50.4
Bus	24.5	2.3
Total (tonne/year)	4,268	38,942

Parameter	Unit	Value
Black Smoke	Hartridge Smoke Unit (HSU)	65
Carbon monoxide	g/km	24
Hydrocarbon	per cent by volume <sup>04</sup>	
	g/km	02
	ppm	180
NOX	g/km	02
	ppm	600

## The polythene plight

**D**HAKA'S sewage network is considered one of the world's worst. Unchecked dumping of polythene bags in drains over the last two decades has made it even worse.

When polythene bags arrived in the early 1980s, city dwellers found it handy as an alternative to jute-fibre shopping bags. But few had thought it would soon deal a severe blow to the already fragile drainage system in the city.

These days one will find few shoppers in the city who do not carry goods from clothes to foods in polythene bags, mostly black ones, hardly knowing what harm they are causing to their own health and the environment.

According to data provided by the Environment and Social Development Organisation (ESDO), more than ten million polythene bags are used across the country everyday, six million of these in the capital alone. Only 10 per cent of used polythene bags are dumped in dustbins, while the rest is thrown into in drains and manholes clogging the flow of liquid wastes.

The ESDO statistics show that there are now 300 polythene bag making factories in the country and they produce 1,500 bags each on average and 90 per cent of them are made with black dye, which is a chemical grade.

"When foods are contained in black polythene bags, subtle *trass asidint* mingles with it, which ultimately accumulates in the stomach and causes various intestinal diseases," said environment expert Hossain Shahriar.

Echoing the same sentiment, Rabi Gopal Biswas, director of the Environment Directorate, said the black chemical used in polythene bags may cause cancer if black polythene is always used in carrying food items without using additional cover. "We are simply inviting various health hazards by widely using polythene bags," he said.

Rabi said 90 per cent of the polythene bags used in our country's kitchen markets are black ones, which is the main concern for the environmentalists.

Polythene is a compound element. In Bangladesh, two recyclable chemical compounds - propylene and polythene - are used in making polythene. Its melting point is 120 centigrade to 130 centigrade. It sends C, CO<sub>2</sub>, into the air while melting. Of them, CO is a dangerous compound.

Although scientists invented polythene and polythene products in the late 19th century, it captured the US markets in 1958 while it stormed the Bangladesh

### The government is not doing enough to control use of polythene bags that have devastated Dhaka's drainage system, writes Atia Moazzema Shammi

market in the early 1980s, nearly 100 years after its invention.

But this chemical product soon proved to be environment-unfriendly. So many countries have given up its use for the greater sake of the environment. But Bangladesh could not take any steps to ban production of polythene bags despite widespread protest by the environmentalists.

Abu Mokeram Khondaker, executive director of the Association for Environment and Human Resource Development (AFEHRD), said in heavy construction works are going on in some city areas, which were once the dumping sites of garbage.

He said the polythene bags, which remained beneath the newly constructed buildings, would gradually make the structure fragile as polythene bags do not allow the soil to settle firmly. Few construction firms will take the extra-trouble of removing the polythene bags before going for construction.

In 1992, production of all types of polythene bags was banned but the decision could not be enforced for lack of alternative arrangement. In 1994, the then BNP government had again taken a move to ban polythene bag production but ultimately it succumbed to the movement of polythene bag manufacturers.

During the 1998 flood when water stagnation had taken a serious turn in the city, the Awami League government had decided to prohibit polythene production. But the decision was shelved for reasons unknown.

Again on January 18, 2000 then Prime Minister Sheikh Hasina approved a decision banning polythene production. To this end, a high-profile committee was also formed. The committee had decided that black polythene bags would be banned immediately and then production of all types of polythene bags would be banned in phases. Unfortunately, this government decision too has lost in the piles of red-taped files.

The movement against polythene bags, spearheaded by the Environment and Social Development Organisation (ESDO), gained momentum in the early 1990s although polythene bags captured the market in the early 1980s.

About the success of their movement against use of polythene bags, ESDO Executive Director Hossain



Shahriar said, "Even though we could not yet achieve hundred per cent success - total ban - we have been able to raise public awareness about the adverse effects of polythene bags. Now a large section of the people realise that use of polythene is harmful both to public health and the environment."

He said some neighbouring countries like India and Pakistan, where polythene use has been banned in several cities, had welcomed the movement. Production of black polythene bags in Sindh province of Pakistan while all types of polythene bags in the Indian city of Mumbai has been banned. "If they can succeed in their movement, we too can," Shahriar said.

He said the use of polythene bags in the Dhaka Cantonment area has already been banned and city dwellers elsewhere of the city can follow suit with a firm determination for the greater sake of the environment.

Shahriar said some prominent shopping centres like Mela, Arong and Prabortana provide goods in paper bags instead of polythene bags. "This awareness will continue to grow," he hoped.

The encouraging sign is that more organisations like the Polythene Bag Resistance Co-ordination Committee and Bangladesh Environment Movement have joined the anti-polythene movement.

On August 4 this year, they held a seminar titled "Polythene: Its Impact on Health and Economy" where experts opined that the country's environment is being pushed towards a disaster through massive use of polythene bags.

Recognising the long-term adverse impact of polythene bags, President of Polythene Bag Manufacturers' Association Alamgir Iqbal said, "The government may ban the production of black polythene because it's very harmful to the environment but we'll oppose the idea of banning the production of all kinds of polythene bags."

Kazi Muhammad Shish said research is on abroad to produce environment-friendly polythene bags using degradable plastic technology, which will automatically be perished after a certain period of time. "This technology will also come to our country soon, but we will accept it only after reviewing its pros and cons."

"We should not allow the polythene factories to produce environment-unfriendly products considering the fate of hundreds of workers of the sector. They could easily be rehabilitated somewhere else like the textile sector. What I understand is that we need a total ban on polythene production right now," he said.

- NewsNetwork

## Need for a national clean-up strategy

ANWAR HOSSAIN MANJU

**F**rom the middle of the 18th century up until the time of the World War I, coal and steel were the main commercial commodities. Coal is used as fuel and for energy production. Networks of railroads, canals were built for efficient communication. From around 1910, throughout the world wars and up until the early 1960s, coal was being replaced by fuel oil, gasoline and electricity. Networks of highways largely replaced the railroads and canals. The chemical, pharmaceutical and petrochemical industries grew and new synthetic products, such as plastics, antibiotics, pesticides and fertilisers were produced. In recent decades, the electronic industry has become ever more important and nuclear power has been used for energy production.

Each epoch has coveted its characteristic set of environmental problems. Many of the problem facing us today are legacies from the previous epoch, one of the environmental problems that has been acknowledged in recent years is the large number of sites contaminated through industrial or other human activities. These sites include uncontrolled and closedown waste dumps but also former production facilities. Urban areas are frequently contaminated through vehicle exhaust. Leaking drums containing toxic waste is another aspect of problem. One major trouble with contaminated sites is that the problem pollutants can accumulate undiscovered in soil for a long time before the potential hazard is identified.

With growing environmental awareness and the ever-increasing demand for new land for development these contaminated sites have become prime issues of national environmental concern of Bangladesh. The main question has been whether or not these sites represent a public health hazard and to what extent and with what urgency steps toward remedial actions have to be taken. Another major issue is who should share the cost of investigation, classification and remediation, especially in situations where it is impossible to identify the party responsible for the contamination. The development of national clean-up strategies is largely a governmental issue, while environmental remediation technologies are being developed by countless entrepreneurs with varying degrees of success.

In tackling environmental problems of the country, various environmental laws have been made from time to time in Bangladesh. There are 200 sectoral laws that are in force with environmental issues. They focus mainly on land use, air and water pollution, noise, toxic chemicals, solid waste, forest conservation, wildlife protection, mineral resources, environmental health and sanitation, etc.

Dhaka alone produces more than 3500 tonnes of solid waste every day. But only 42 per cent of the wastes is collected and dumped within the city limit by the Dhaka City Corporation. Dhaka's waste disposal and management system remains one of the most neglected services. The situation is turning worse as the city keeps expanding and its population keeps swelling at a geometric pace.

Anwar Hossain Manju is a vice-chairman of the FEJB.