

# Clean Dhaka initiative: Needed a pragmatic approach

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**D**HAKA, the emerging megacity is beset with a number of socio-environmental problems. Traffic congestion, water logging, solid waste disposal, air pollution, pollution of water bodies make the city unfit and unbearable for living in a healthy and sound manner. In the past the city was clean, the air was fair to breathe, fewer traffic and the river was the main lifeline of trade and commerce. But what we see today the black smoke in the sky, garbage in the streets, toxic pollutants in the water bodies and the halted traffic in the thoroughfares. City cleanliness largely depends on street brooming, removal of drain silts, quick disposal of waste, removal of construction materials from the streets and footpaths to ease traffic and pedestrian movement.

Solid waste management is the priority area of urban concerns for the municipality as it plays a vital role in the city image building. As the city is expanding and population increasing, the handling of wastes is becoming a serious problem. The existing capacity and trend of waste management do not perform the desired level of service due to lack of planning and coordination. The present service of waste management is primitive in nature and follows the hierarchy of waste collection-transportation disposal. The present system of waste management has drawn much criticism. The city streets remain littered with garbage, the communal bins spill over with wastes creating a messy scenario. The organizational capacity and limited finance permit only a fraction of the city's growing quantity of solid waste to be collected and disposed. Dumping sites in the city area are becoming more and more difficult to obtain and trucking of wastes out of the city is becoming more and more expensive. Local community based collection schemes are a shining light but the secondary collection points are again gloomy. The disposal sites are creating havoc, threatening surface and ground water pollution.

Solid waste management is directly related to city dweller's health and hygiene as well as overall environment of the city. The Hon'ble Prime Minister's directive towards the cleanliness of the city is timely when the city environment is in a crucial stage. The air, water and land are alarmingly polluted with the different types of wastes. Scattering of household garbage on the roads, overflowing of sewerage and drainage systems, industrial discharge in the water bodies, toxic wastes from the hospitals make the city environment risky and unfit for habitation. Waste management is a complex task. It has multi-dimensional focus to attend social, environmental, financial and technical. The low level of institutional capacity and financial management, transparency and accountability, public attitude and awareness, political will and commitment are the factors

responsible for the inefficient and improper waste management.

Waste management problem cannot be solved if people think that it is duty of the municipality alone. Co-management is the effective way to solve the problem with sharing the responsibilities among the stakeholders -- the community, the municipality, the informal sector, the business and the NGOs. The community has a great role to play in solving the solid waste problem by keeping their holdings clean and effectively using the facilities provided by the municipality. We have many examples for learning from the Asian countries. Surat's successful intervention after the plague through massive clean up operations, the success story behind the present clean Calcutta, the privatization process of Hyderabad, the comprehensive waste management policies and its implementation in the Philippines, the public awareness programme of the Bangkok Metropolitan Authority are some of the successful practices.

Street sweeping, drain cleansing, waste collection, transportation and safe disposal are the mandatory functions of the City Corporation. About 6000 sweepers are engaged for sweeping the city streets. But hardly the city dwellers are getting benefit due to inappropriate job planning and weak monitoring system. The workers are not responsive as well as less committed and sincere. It has been recorded in a study that 50 per cent to 60 per cent of the staff are available for actual work on any particular day. It has been further alleged that seven days after receiving their wages 30 per cent of the staff do not report for duty. About 20 per cent of the staff are in replacement duty on mutual understanding.

Citizen complaints redressal system (receiving and acknowledging complaints) must be introduced to make the DCC more responsive and responsible. It should set up an operation room where the complaints on its cleansing services can be received and promptly dealt with. A format for reporting the daily activities (daily activity report) need to be introduced to cross check the actual supervision done such as -- Sweepers attendance; Assignment of the day; Supervision of the inspector; Road swept; No of vehicles deployed; Containers lifted; No of trucks reached the disposal site, etc.

Disciplinary actions against absenteeism -- say, from wages reduction upto dismissal -- need to be taken for negligence of duties. Disciplinary actions for bad performance and incentives for good performance should be practiced to increase work efficiency and improve competence. The cleaners should be provided with uniforms and protective clothing, their works should be praised and given social recognition. A health check up (medical card) should be provided at no charge. The cleaners should be motivated or made aware of the importance of the work they are

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doing for the city.

The waste collection and transportation are the key areas for which the citizens are concerned. The household wastes are taken by the cleaners from an accumulated centre in wheelbarrows and dumped near the containers. At some places the community has arranged their informal house to house collection services. DCC has employed extra labours for loading the garbage into the containers from the street in the accumulation places. The main problem that DCC is facing for placing of garbage bins at suitable locations is the opposi-

tion of the public as NIMFY syndrome (Not In My Front Yard). The transport department provides trucks for transporting the wastes to dump sites. But normally it is found that the containers are overflowing with garbage occupying road spaces. The situation can be improved through assessing the generation of wastes and providing with an adequate number of community bins or containers for avoiding overflowing or spillage around. It is usually reported from the public

that the containers are not taken away for disposal. This complaint can be solved if the log slips are checked in the dumpsites and stamped and entry is maintained in a register. At the garage and at the dump site data needs to be collected and maintained for counter checking helps to monitor the shortfalls of vehicles. Spot checks are important for addressing the complaints and monitoring improvement standards. In Kolkata the system of waste collection and transportation has been improved due to computerization of the system, which makes the whole process transparent.

In Surat the post plague cleanliness was found successful due to administrative restructuring and decentralization of the system. In Hyderabad the transportation of waste has been a system of contracting out to a private company and the interface of the primary and secondary collection has been solved through a mini transfer station.

Public awareness and motivation is essential for improving the waste management system. For conducting publicity campaigns handbills, posters, hoarding boards need to be displayed at prominent places.

Audio-visual publicity campaigns to educate people regarding littering, proper use of community bins and benefits of cleanliness and hazards of improper disposal or littering should be demonstrated. Inter ward competition with cash reward may be given as an incentive for good performance. Cleanliness marches could be organized in different wards and placards and banners depicting cleanliness slogans may be carried to educate the public as well as encourage their participation. Bangkok Metropolitan Authority has maximized the people's participation by educating them

about the benefits and means of practice through colourful printed pamphlets. Waste minimization programme has been encouraged by calling for people's participation in "Think Over and Saving Resources" by asking them to adopt 4R principles (Reduce, Reuse, Repair and Recycle) for the recovery of valuables at home and reduction of solid waste generation.

Environmental education and awareness programme in the school is an investment in a country's future. Personal and social health and hygiene programme in the school will build knowledge, attitude, ethical and moral value of the school children, which will make them environmentally and socially responsible citizens. Observation of the cleanliness day in the schools/cleanliness campaign in and around the campus is essential for the school children to make them eco-conscious. The school programme in Bangkok -- "Recycling Bank" -- for the learning of the school children about savings as well as growing consciousness towards waste reduction and resource conservation is very interesting. This recycling bank works same as the monetary bank but it accepts the deposit not in cash but in trash which bank office converts into value and enters the amount in the savings book. The "Clean and Green Candy" programme in the school of Philippines and the "Garbage to Gardens" school education programme in Bangalore are some of the successful motivational programmes for the school children.

Regulation and enforcement are essential to make people disciplined. The only legal document for waste management is the Municipal Ordinance '83, which is outdated and insufficient for practice. Solid waste management policy is needed with a comprehensive programme detail-function, respon-

sibility, standard, enforcement. The waste management policy of the Philippines is well defined with a provision of fines in money or community service or blood donation for its violation.

**Opportunities for improvement:** It is encouraging to say that lot of initiatives and efforts towards the clean environment are taking place in Dhaka. If the doorstep waste collection and recycling programmes are given collaborative support and DCC's activities are made transparent and accountable, the waste scenario of the city may be changed. Many community initiatives are taking place, the urgent need is to prepare a database to make their activities well integrated and accounted for with the municipal secondary collection. This perhaps will improve the scenario of scattered garbage around the container.

Mini transfer station can be set up, which will concentrate the wastes in one place suitable for integrating and monitoring the activities. Area wise integrated programme street sweeping, drain cleansing, waste collection and transportation can be privatized leasing out to a company for analyzing the suitability, performance and cost-effectiveness on a trial basis.

City Corporation should try to strengthen its institutional capacity and financial management. Strong monitoring activities with assigned responsibilities, disciplinary action as well as incentive would implement regulation and enforcement, facilitate and encourage people's participation. These are the key areas that DCC should give attention to for a clean Dhaka initiative.

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A Dhaka city street scene: Obnoxious, to say the least.

PHOTO: STAR

## A friend of farmer and environment

SM ATIKULLAH and DR GUL HOSSAIN

**E**ARTHWORM has long been known as "the friend of the farmer". It has the remarkable capacity to ingest organic waste materials, which pass through its alimentary canal and are deposited as castings on the soil surface.

Earthworm's gizzard is a novel "colloidal mill" where the feed is ground into particles which are then deposited on the soil surface giving the soil a loose structure, high porosity, good water holding capacity, and enhancing microbial activity. In short, it recycles organic solid and liquid wastes to the soil, converting the wastes into readily available plant nutrients in a balanced condition. Earthworm casts, known as vermi compost, are the best compost material.

In the prologue of his book *Harnessing the Earthworm*, Thomas J Barret (1944) wrote, "In a study of the soil building methods of nature, we have found a force at work in the earth the earthworm which appears to have been evolved for the specific job of rebuilding the soil from the biological end-products of plants and animals". Unfortunately, the vital role of the burrowing earthworm in building soil has sadly been overlooked in modern agriculture. It was apparently necessary to ignore this beneficial creature in order to promote chemical agriculture. But the fact is, working through geological ages down to the present time the earthworm has been and still is one of the great integrating force of nature in building the soil for crop production. Practically all of the fertile soil of the earth's surface has passed through the gizzard of the earthworm and in the process it has continually renewed and maintained the fertility of the surface layer of the soil, upon which the life of living creatures, including man depends, for food.

### Types of earthworms

Under scientific classification the earthworm belongs to class Oligochaeta of the phylum Annelida. There are 11 families, 152 genera and some 1,200 species of earthworm throughout the world. Of these five families are well known: Lumbricidae found in North America, Europe and northern Asia; Moniligastridae inhabiting the Indian subcontinent including Bangladesh, Sri Lanka, Malaysia, and the eastern parts of Africa; Mgaecoleidae also drier parts of India, Australasia and South America; Endriidae inhabiting central parts of Africa; and Glossocollidae in South and Central America and

Southern America.

Many species grow to a length of only a few centimeters, but some tropical species attain a length over three meters (about 11 feet). In our soils four species of earthworms predominate: Lumbricus, Seloginosa, Pubelus and the Garden Earthworm.

### Behaviour

Earthworms live in moist soil containing organic matter. They shun daylight but frequently come out to the surface of the soil at night to throw the excreta, the castings. In day time they appear on the soil surface only under unusual conditions like flooding. Sandy loam or clay loam soil is conducive to earth-

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worms. The body of the earthworm is soft, cylindrically shaped and segmented that tapers at both ends. In general, they are uniform in colour, usually pale red, but can also vary from dull pink to brown. They are hermaphrodite, each worm having both male and female reproductive organs. However, they usually cross fertilize with mates. The eggs, containing larger yolk, are buried in earth in capsules formed from secretions of the chickened portion of the body wall, the clitellum. The capsules protect the young worms until they hatch small, fully developed worms. Some species live up to 15 years. In healthy soil the earthworm population can go over several millions in an acre of land. The total weight of earthworms can be up to 750 kg and their castings more than 200 tons per acre.

### Food

Earthworms derive nutrition from organic matters of the soil. Swallowing the soil with all that it contains, earthworms burrow deep into the earth, ridding and honeycombing the earth to several feet below the surface. The mineral subsoil, in its passage through the intestine of the earthworm, undergoes chemical changes and becomes water soluble. In order to excrete, earthworms come to the soil surface and

deposit their castings rich in plant nutrients in readily available form for plants to take up. The tunnels earthworms make in the soil increases the air capacity of the top soil by 60 to 75 per cent.

### Soil building and crop production

In soils with adequate earthworms, the water penetration improves, plough sole is eliminated, rainfall is quickly absorbed instead of running off or standing on the surface (waterlogged condition).

Earthworm casts make acid soil less acidic. The reduction in acidity can be as high as 75 per cent. They also reduce alkalinity of the soil, so that highly alkaline soil are rendered less alkaline. The earthworms thus produce top soil close to neutral, with pH around 7.

The casts contain high percentage of carbonates as well as high percentage of nitrogen. They help increase the organic content of the soil in the top layer. Bacterial multiplication and functioning are favoured by the action of earthworms. They continually restore the plant food elements to the surface from subsoil and thus correct the effects of leaching. The soil regains its fertility close to its potential level. This is because the nutritional elements of the soil become concentrated in the castings and in a more balanced condition.

Therefore earthworm castings have a much more productive value for plant growth than other soils. Just because of a balanced soil nutrients, plants grown in soils rich in earthworms acquire greater resistance to pest and diseases.

It has been reported that some fruit trees which never borne fruits became productive after earthworms have been established around them.

### Conclusion

Bangladesh soils are fast becoming impoverished mainly due to intensive cultivation with application of chemicals: fertilisers and pesticides. Not only soil nutrients are becoming exhausted, the soil environments have become polluted with chemical poisons. As a result crop yields are declining. There is now an urgent need to rebuild our soils and all possible efforts should now be employed. Earthworm culture, known as vermiculture, in our soils is an important vehicle for rebuilding degraded soils.

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