

Finding life for the lifeline of the city



Md. ASADULLAH KHAN

During the last two decades the country has experienced phenomenal urban growth. With rapid growth compounded by high concentration of population, the capital city has now become an epitome of urban squalor, poverty and environmental abyss.

Despite the everyday trauma, exhaustion and rigour, people are endlessly attracted to the city for it seems to have work, livelihood and even prosperity on offer. During the last one decade, the pace of urbanization in Dhaka has only resulted in proliferation of population, poverty and pollution. At the same time, quality of housing, health and hygiene has gone down.

In the meantime Dhaka city's population has swelled to over 10 million which implies increasing demands for basic city services -- the most important ones being the demand for safe and reliable water supply and effective sewerage system. Dhaka city's crumbling sewer network is almost a century old, put in place for a population of just a few lakhs in the post-partition days.

Today it breaks down frequently under pressure of wastes of about eight million more people than it was designed for. The sewer lines lead to drains, which take the sewage, much of it untreated, directly into the river Buriganga and Shitalakhya on the northern part and Turag and Balu -- which are now almost dead -- on the western side of the city belt.

In the city water pipelines run next to sewer lines with both lines being leaky in many places. Consequently the threat of contaminated water and disease is perpetual. In the recent past some dailies ran a series of reports indicating that Dhaka WASA's supply of water to vast areas stretching from Bangladesh to Lalbagh to Mohamudpur to Pallabi in the city had become unsuitable even for household chores, let alone for drinking.

In view of the present catastrophic situation, environmental levies may be charged and these levies can be used to fund woefully under-staffed regulatory services and support environmental fixes for specific industries. Maybe the government at such a critical juncture may not be able to do it alone but it must prepare an action plan and ask for societal help as in the case of the Tal Lake recovery project in Nainital and Lake Placid Recovery Project in the Uttaranchal Pradesh in India.

Residents of Bangshal, Nazirabazar, Kasaituli, Begumbazar, Moulavibazar, Becharam Dewry, Imanganj, and Rahmatganj complained that WASA's supply of water was full of detritus and looked like coloured soup. Highly polluted water imperils human health and in most cases, rivers being the original source, it seriously imperils aquatic and terrestrial ecosystem on which life depends. There are evidences that we now face a fast-deteriorating situation occasioned by use of water that is full of harmful bacteria and hazardous wastes.

There is a close link between economic growth, human development and good management of the natural resource base -- mainly water bodies and forests. Unfortunately socio-economic development appears threatened by environmental degradation, polluted water and extinction of forests. Despite an over-all improvement in the living standard, marked by fast-paced urbanisation, the outlook for sustainable development in such big cities as Dhaka, Chittagong, Rajshahi and Khulna is not encouraging. The gains are being offset by certain negative trends, such as the growing scarcity of fresh water and a rise in number of desperately impoverished people.

Reports published in the dailies quoting WASA sources indicate that water of the river Buriganga, and even Shitalakhya has become polluted beyond redemption. Experts point out that the present dissolved oxygen level is well below 4 mg per litre -- the minimum requirement for the survival of any species of fish or any other aquatic life forms.

Experts say that out of ten lakh cubic metres of effluents and liquid waste released in rivers, lakes and canals in the city, the river receives an estimated 4,50,000 cubic metres of waste water per day only through three points: Hazaribagh tanneries, Dolaikhal and Pagla sewage treatment plant. Experts further say that water discharged through these three sources consumes 40 tonnes of dissolved oxygen per day from the river water

while in the teeming northern part of the city filthy water in choked drains stagnates for days, even months and years.

Only about one third of the city has the luxury of an underground sewer system. In most areas it can be seen that human excreta flows directly into open surface drains that ultimately falls into the river. Even refuse dumped on the riverbanks finds its way into the Buriganga and Shitalakhya during monsoon rain.

About 200 tanneries in the Hazaribagh area contribute the largest share of pollution load to the Buriganga. Survey revealed that the tanneries pump out about 16,000 cubic metres of hazardous liquid wastes whereas Tejgaon industrial area offloads about 4000 cubic metres of polluted liquid waste and other agencies about 3000 cubic metres of wastes into the river Buriganga every day.

The amount of damage done by the effluents has far exceeded other sources. In most of the localities household waste drains connect to the sewer pipe, which also collect the road surface garbage. Consequently, the entire untreated mess then drains into the river that supplies the city with its drinking water. Contaminated even further by oil from barges and leaky vessels, the river is so polluted that the cleansing effect by surging rainwater has become almost impossible.

In fact, the cleansing effect is no match for the 33000 cubic metres of solid and liquid wastes of all varieties dumped into the rivers and lakes of Dhaka city. The biggest onslaught has come from the encroachment of riverbanks and the river itself. Even markets, hotels and vegetable and fruit storage yards have been built intruding several hundred feet into the river. A vast chunk in the water area has fallen into the hands of the encroachers who enjoy political patronage. On the other hand, rampant pollution of the river water that has already killed aquatic life now threatens human life and human settlements on the riverbank.

Another decision has to be taken about small-scale industries. It should be made clear to all such entrepreneurs that these would not

be allowed to enter certain fields, like chemicals, especially in the vicinity of the river bank. Because of the indiscriminate discharge of chemicals and other industrial wastes from some 115 factories, on both sides of the Shitalakhya river right up to Shimrail, Charsindur, Rupganj and Ghorasal, the Shitalakhya water has been seriously contaminated.

However daunting the solution might be, the rivers Buriganga, Shitalakhya, Balu and Turag and all such water bodies like Gulshan-Banani-Baridhara lake and Uttara lake have to be saved to prevent an ecological disaster. Reports have it that the Directorate of Environment (DoE) while identifying key sources of pollution load of these water bodies mentioned discharges from Rayerbazar sluice gate, Dolaikhal, Pagla sewage treatment plant, Hazaribagh tanneries, Tejgaon industries and hanging latrines on the banks of these rivers as the main culprits DoE further identified about 120 installations for encroachment on the rivers mostly by influential persons and political leaders.

What is most needed is the establishment of a 'Water Body Development Authority' invested with the power to evict illegal construction and settlements along the bank of the rivers and lakes of the Dhaka city and Narayanganj. The wide ranging power will include the task of river safety maintenance including setting up of a centralised effluent treatment plant as well as dredging the river to ensure its smooth flow.

Admittedly, DWASA and Dhaka City Corporation lack the resources and technical and managerial expertise to deal with the trash and hazardous waste of an increasingly consumerist economy. There are landfills at certain locations of the city but these are hotbeds of disease with poisons leaking into the surroundings.

As for sewage disposal system, sources say that DWASA at present has the capacity to treat sewage of about 40 lakhs population of the metropolis. So more than half of the fiscal load of the city ultimately

finds its way into the rivers and lakes, totally untreated. The Buriganga, Shitalakhya and the adjoining lakes and low-lying areas of the city of Dhaka and Narayanganj have ultimately turned into giant sewers.

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levies can be used to fund woefully under-staffed regulatory services and support environmental fixes for specific industries. Maybe the government at such a critical juncture may not be able to do it alone but it must prepare an action plan and ask for societal help as in the case of the Tal Lake recovery project in Nainital and Lake Placid

Recovery Project in the Uttaranchal Pradesh in India. That means citizens must join the big clean-up. At the same time, industrial societies have an obligation not only to re-cycle but also to reduce the waste they generate.

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Pollution and encroachment choking the Buriganga, lifeline of Dhaka.

Sanitation scenario since SACOSAN 2003

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THE first South Asia Conference on Sanitation (SACOSAN) was held in Dhaka from October 21 to 23, 2003, and was organised and hosted by Bangladesh. This inter-governmental event was attended by state delegates including ministers from India, Pakistan, Nepal, Sri Lanka, Bhutan, the Maldives (the then Saarc members), as well as Afghanistan and Myanmar. This event has been considered a milestone in the sanitation sector in the region.

The Second SACOSAN has been held in Pakistan last week as a step towards meeting the Millennium Development Goals (MDGs) related to sanitation in this region. The conference was originally scheduled to be held in November 2005, but because of the devastating earthquake that took place in Pakistan at that time, and subsequent internal rearrangements, it was rescheduled to be held from September 20-22, in Islamabad.

The Dhaka Declaration recognised the fact that although much had been achieved in the last decade, the overall picture of sanitation in South Asia, with the practice of open defecation, unsanitary disposal of human excreta and other unhygienic practices by the majority of people in the region, still posed a serious threat to the quality of life, control of disease (especially affecting children under five years of age) and the environment.

The participating countries stressed the need for pursuing common strategies under a common definition of sanitation, and to accelerate the progress of good sanitation and hygiene promotion in South Asia to improve the quality of life, reduce child mortality and morbidity, thus fulfilling the MDGs and the commitments made in the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002.

The conference noted that significant improvements in the situation of sanitation and safe water would have a positive impact on poverty reduction by increasing health and productivity. Therefore, this should have a central role in the countries' poverty reduction strategies, while noting at the same time that it is the vulnerable and marginalised population in urban and rural areas that suffer most from minimal access to sanitation facilities.

It has been observed from the experiences of the last two decades that conventional, top-down sanitation programmes driven only by high hardware subsidy have not been able to bring about the desired

improvements and sustainability, but that the use of direct and indirect subsidies for software are a must for sustainable sanitation promotion. The first SACOSAN underlined the commendable success achieved in providing basic sanitation (every household having access to a hygienic latrine and practicing good hygiene) through various government, NGO and small-scale private initiatives.

The first conference agreed that the focus of proper sanitation and hygiene in the region should be based on a paradigm that is: "people-centered, community-led, gender-sensitive and demand-driven."

Progress since the first SACOSAN

In a short span of time, i.e. from late October 2003 till date, there has been quite some progress in the sanitation sector in Bangladesh, specially in terms of policy decisions by the government. This, in brief, can be stated as the following:

- Government has committed to achieve 100 percent sanitation by 2010
- Developed the National Sanitation Strategy (NSS) in early 2005
- Formed the National Sanitation Secretariat and made it operative
- Worked out the pro-poor strategy for water supply and sanitation sector
- For all sanitation related activities, entrusted the leadership to the Local Government Institutions (LGIs) -- Union Parishads in the rural areas and Wards in the Municipalities and City Corporations, in the urban areas

- Earmarked 20 percent of the Annual Development Programme (ADP) grant to LGIs for sanitation in order to involve the LGIs in the process of planning and implementation of the sanitation campaign
- Targeted the hard-core poor with government grant
- Provisions have been made for funds for hygiene promotion and community mobilisation
- Involved Gram Sarkars in the sanitation campaign
- Introduced special financial awards/incentives for areas with 100 percent sanitation coverage
- Special encouragement given to the Department of Public Health Engineering (DPHE) for latrine promotion among the hard-core poor
- Development of hygiene messages specially for areas that have already achieved the 100% latrine coverage
- Mass-media campaign being undertaken to create mass awareness

As a cumulative effect of all these positive factors, sanitation coverage as of March 2006, as per the reports of the National Sanitation Secretariat, has reached an impressive figure of 71.77 percent -- an increase by 38.54 percent points just in approximately three years (the baseline of 2003 found it to be at 33.23%).

Critical observations

Despite the impressive advances that have been made so far, there have been some limitations in the sanitation efforts in the country as well. A brief account of those is as follows:

The national sanitation coverage, as quoted by the National Sanitation Secretariat, is predomi-

nantly based on household latrine coverage -- the area of sanitation in public places like markets, haats, ferry-ghats, schools, railways, riverine transport, and even homeless or street people in urban areas have been overlooked. In addition, existence of latrines has been given the main focus, and not their proper/effective use by the population. This is a serious by-passing of the NSS'05 guidelines which clearly state that 100 percent sanitation means: there will be no open defecation, hygienic latrines are available to all, use of hygienic latrines by all, proper maintenance of latrines for continual use, and improved hygienic practice.

Another area of concern is the fact that while the National Sanitation Secretariat has been putting forward impressive sanitation coverage figures for the country, there has hardly been any proper, neutral, third-party assessment to validate these claims. It appears that the government has presently set its target of 100 percent latrineisation first, which is to be followed by a second phase where the main focus would be on the promotion of hygiene to ensure proper and full use. This is a questionable outlook/strategy as, in many areas, many of the latrines constructed, but not used or maintained, might face the risk of damage or even destruction before the hygiene promotion phase in fact takes off.

Though the government has shown its willingness/eagerness to support the hard-core poor in constructing their sanitation facilities through allocation of the 20 percent ADP grant, there are concerns that these funds are not necessarily reaching only them -- a

certain amount is also being channeled to the middle-class and well-to-do people of the society. This is evident from some initial results coming out from one action research carried out by WaterAid Bangladesh in the Chittagong Hill Tracts, and Thakurgaon in the north-west (2006).

While the government has commendably entrusted the LGIs to take the leadership in the sanitation drive in their areas, lack of capacity in many places has been a major stumbling block in this regard. Traditional apathy towards the NGOs and development partners has also posed a problem in creating fruitful partnerships among these agencies and the LGIs as a whole.

As of now, the government is yet to come out with clear-cut views on the 'land tenureship' issue, in relation to the slums of the metropolitan cities, to work in a concerted manner with the various stakeholders regarding solution to urban sanitation problems.

Way forward

Some considerable progress in terms of sanitation coverage has been achieved during the past few years. At the same time there are issues which, if not taken care of, may pose problems in the successful achievement of our goal -- sanitation for all by 2010.

The political commitment shown by the government in its drive for sanitation improvement till date has been remarkable. This has to be maintained in the coming days so that we do not lag behind. Sanitation has to be achieved in its totality, as laid out in the National Sanitation Strategy, and this puts the entire issue on a new footing that has to be dealt with accordingly.

As a disaster-prone (mainly storms and floods) country, Bangladesh must have an adequately satisfactory disaster response strategy to ensure that people have access to sanitation facilities during emergency periods, as well as find readily available means and arrangements to cover up the damage quickly afterwards.

Achieving 100 percent sanitation by 2010 in this country will largely depend on how we really face the challenges of sanitation in the urban areas, particularly for the slums of the metropolitan cities. In addition, strengthening the capacity of LGIs for sustainable improvements, and effective monitoring and evaluation of sanitation progress will be key issues for the government to achieve 100 percent sanitation.

Phylogeny for plant life

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PHYLOGENY is the history of the evolution of a species or group, especially in reference to lines of descent and relationships among broad groups of organisms. Fundamental to phylogeny is the proposition, universally accepted in the scientific community, that plants or animals of different species descended from common ancestors. The evidence for such relationships, however, is nearly always incomplete, for the vast majority of species that have ever lived have become extinct, and relatively few of their remains have been preserved. Most judgments of phylogeny, then, are based on indirect evidence and cautious speculation. Even when biologists use the same evidence, they often hypothesize different phylogenies, though they do agree that life is the result of organic descent from earlier ancestors and that true phylogenies are discoverable, at least in principle.

Taxonomy, the science of classifying organisms, is based on phylogeny. Early taxonomic systems had no theoretical basis; organisms were grouped according to apparent similarity. Since the publication of Charles Darwin's Origin of Species in 1859, however, taxonomy has been based on the accepted propositions of evolutionary descent and relationship. Biologists who postulate a phylogeny derive their most useful evidence from the fields of paleontology, comparative anatomy, comparative embryology, and biochemistry. Studies of the fine structure of cells, and geographic distribution of flora and fauna, are also useful. The fossil record is often used to determine the phylogeny of groups containing hard body parts; soft parts are generally not preserved. Most of the data used in making phylogenetic judgments have come from comparative anatomy and from embryology. In comparing features common to different species, anatomists try to distinguish between homologies, or similarities inherited from a common ancestor, and analogies, or similarities that arise in response to similar habits and living conditions. Biochemical investigations carried out in the latter half of the 20th century have contributed valuable data to phylogenetic studies. By counting differences in the sequence of units that make up protein and deoxyribonucleic acid (DNA) molecules, researchers have devised a tool for measuring the degree to which different species have diverged since evolving from a common ancestor. The earliest organisms were probably the result of a long

chemical evolution, in which random reactions in the primeval seas and atmosphere produced amino acids and then proteins. It is supposed that droplets containing proteins then formed membranes by binding molecules to their surface, and these membrane-bound proteins are said to have become organisms when they developed the capacity to reproduce. It is not certain whether these earliest self-reproducing organisms were proteins, nucleic acid-protein associations, or viruses. There is general agreement that they were heterotrophic organisms i.e. those that required nourishment in the form of organic matter from early seas. Later, autotrophic forms appeared, having the ability to make their own food from inorganic matter. These organisms were the earliest bacteria; they could store energy as food and release energy as needed through respiration. Cyanobacteria (sometimes called the blue-green algae) are thought to have been the next evolutionary step in that they were able to use photosynthetic pigments to manufacture their own supply of food and, therefore, were not totally dependent on their environment for nutrients. After the cyanobacteria there appeared an extensive array of algae, molds, protozoans, plants, and animals. Three groups of algae can be dismissed with passing mention, as they arose from uncertain ancestors and have given rise to no further groups. These groups are the chrysophytes (yellow-green and golden-brown algae, chiefly diatoms); the pyrrhophytes (cryptomonads and dinoflagellates); and the rhodophytes, or red algae. Three more groups have greater phylogenetic importance: the chlorophytes (green algae), which almost certainly gave rise to the land plants, i.e., the bryophytes (mosses and liverworts) and the tracheophytes, or vascular plants (including all of the higher plants); the euglenoids (unicellular, flagellate organisms), which suggest a broad connection between plants and animals at this primitive level; and the phaeophytes (brown algae), which some biologists have considered to be a probable source of the animal kingdom. Finally, the protozoans (unicellular prokaryotic microorganisms) were derived from unknown, more primitive ancestors, and one or more groups of protozoans have given rise to metazoans -- i.e., multicellular animals. Land plants contain two major groups, bryophytes and tracheophytes, which differ in many ways but which share distinctive characteristics for adaptation to dry land. These include the housing of the plant embryo in maternal tissue.

Bryophytes are descended from green algae and include mosses, liverworts, and hornworts. Only small quantities of water are needed for their reproduction, so that the sperm may travel to the eggs. The fertilized egg matures within the maternal tissue. The plant is protected from desiccation by a waxy cuticle. Bryophytes have apparently not advanced far beyond their algal predecessors and do not seem to be the evolutionary source of other groups. All the dominant plants on Earth are included in the tracheophytes. The tracheophytes' development of large plant bodies has been made possible by having vascular parts that carry water and food inside these plants, and by a dominant sporophyte stage with a microscopic-sized gametophyte. Tracheophytes' tissues have differentiated into leaves, stems, and roots, and in the highest plants seeds and flowers are featured. In explaining the evolution of tracheophytes, it has been suggested that a mutant form of green algae developed a primitive rootlike function with which to supply itself with water and minerals. The progeny of this organism eventually developed bundles of vascular tissues, a stem and leaves, and a cuticle for protection. The early vascular plants are called psilophytes. The development of seeds arose from the retention of the embryo inside maternal tissue. Early seed ferns gave rise to the gymnosperm group, including pines, spruces, and firs. Flowering plants, the angiosperms, probably came from the gymnosperm phase and have two subgroups: the dicotyledons and the monocotyledons.

The history of evolution is full of examples of primitive groups giving rise to more advanced groups, but it should be noted that it is the more primitive and less specialized members of a group -- not the advanced members -- that produce new groups. For example, birds and mammals arose not from advanced reptiles but from primitive, unspecialized reptiles. The data and conclusions of phylogeny show clearly that the world of life is the product of a historical process of evolution and that degrees of resemblance within and between groups correspond to degrees of relationship by descent from common ancestors. A fully developed phylogeny is essential for the devising of a taxonomy that reflects the natural relationships within the world of living things.

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Still much needs to be done to improve sanitation scenario.

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