# Revitalising wastewater management for Dhaka

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**It is essential that we formulate a firm water policy for the city of Dhaka based on its projected growth by the year of 2050. The policy should address key issues like water demand, distribution network, source development, and protection and wastewater management. The policy should emphasize short and long term goals, development and acquisition of appropriate technologies for this sector.**

TRADITIONALLY little attention has been paid to the management of wastewater in our country. With our vast river networks and abundant monsoon precipitation, water has historically been considered as a low cost and abundant commodity in Bangladesh. The perception of unlimited water resources means we haven't paid serious attention to the water economy and aspect of wastewater management. The need for wastewater management surfaces only when we face a serious waterborne epidemic or it creates an obstruction to our normal daily activities, like local disruptions arising from construction of sewer services. With its permanent and ambulatory resident population approaching 12 million, the city of Dhaka is facing an acute crisis in every sector of civic amenities including wastewater management. Assuming a per capita daily requirement of 300:l, the estimated water demand for Dhaka will be close to 3.6 million cubic meters a day, 80 per cent of which should return as wastewater. Water treatment can be a costly proposal involving capital cost for treatment plants, construction of distribution and collection networks and ongoing operation and maintenance. In the absence of proper management and longer term planning, daily wastage in this single sector can be estimated at millions of taka and can be expected to increase. In addition to this direct cost of wastage, indirect expenses in other sectors are equally significant from the lack of or piece-meal approach to wastewater management.

The increasing imbalance between water supply and demand due to the dramatic rise in the city population along with increased industrial activities have put a tremendous pressure on the water supply, collection and treatment systems. Water, including its distribution, collection and treatment can no longer be considered as a cheap commodity. Our approach to the management of water sector as a whole has to be changed based on economic vitality, environmental quality, natural ecosystem bio-diversity and health. A sustainable development of the water sector is needed today to ensure the best use of our limited resources without adversely affecting the ability of future generations to meet their own needs. A comprehensive City Development plan of which wastewater management constitutes a vital part can ensure smooth expansion of city services to match the pace of development. An integrated approach to development activities in this regard is essential to ensure environmentally sustainable development. Urgency of situations sometime compel us to segregate the most compelling issues and address them professionally so that they become part of the solution, not a problem in future. However, piecemeal approach to solve any one problem is extremely unadvisable. In the context of the development of the City of Dhaka, contrary to the integrated approach, opposite trend are quite visible. We try to solve a problem when it becomes explosive rather than foresee a problem and prepare a preventive measure.

It is assumed that about 30 per cent of the residences are now on the city sewer services, which transport raw sewage to lagoons located at Pagla. These lagoons are spread over a land area of 274 acres (12 million sq.ft. approx.). Lagoons are natural treatment system requiring less on-site technical know-how, skilled man-power are generally less costly to operate and maintain compare to other treatment technologies. However, effluent quality from an un-aerated lagoon system rarely attains secondary treatment standards (biochemical oxygen level and total suspended solids level less than 30 mg/l). Toxic sludge accumulation in the lagoons may also pose health threat since the sewer may also carry industrial discharge. Effluent from lagoons is still considered a waste product of little value. Technology is now available to upgrade existing lagoon system to produce tertiary type of effluent. This inlagoon treatment technology still has a relatively low manpower and low-skill requirement. Upgrading operating conditions can lead to increase capacity to treat more waste without spatial expansion of the system. Also of great interest is the wastewater now becomes a valuable product for porential re-use in industries such as fish production, city wash, horticulture, agriculture and irrigation. All these new uses can become a source of revenue and employment for the city and it's citizens. Re-use for industrial and commercial purposes would reduce pressures on potable water supplies and their trickle down benefits in cost saving in treatment, distribution and waste.

For the city of Dhaka, centralized wastewater management is an unattainable idea for many different factors such as land availability, topography, climatic condition and hydro-geological conditions, population density, management problems and many more. Many large urban cities including the City of Riyadh with projected population of 10 million by the year of 2020 are planning de-centralise wastewater management system. Dividing the city into several sewer districts provides the best opportunity to manage technical as well as operational issues. It is apparent that Dhaka City Corporation or WASA is capable but has not yet prepared short or long term plans for wastewater management particularly in view of the rapid growth of the city. Usually government bodies show their best performances when they provide an advisory and supervisory role in development and expansion plans. De-centralizing and perhaps privatizing some or all the wastewater management sector is a potential cost effective and environmentally sound approach to the issues facing our city. The DCC, Dhaka WASA and the ministry of the environment can take their respective roles as custodian or guardian of the city dwellers by protecting their interests whether it is the fixing of users fees or the overall operation and maintenance of the whole system.

In terms of wastewater treatment, there are a variety of systems, which require much less land area than lagoon systems. However, these systems often require highly skilled and dedicated manpower to build and operate. Sludge handling is also a major issue in their daily operation. Treated effluent can be used for many different purposes as previously mentioned bringing quite significant direct and indirect cost savings and revenues for a product that has been traditionally treated as waste. Choosing the most appropriate system for each application will depend on many factors: Technical, capitol and operational financing, socio-cultural and long term environmental impact are all important factors in the decision. To determine the best possible alternative, the following steps are proposed:

1) Identify limits and problems in the existing wastewater management practices.
2) Identify possible remedies based on best management practices putting emphasis on best reuse of treated effluent for beneficial use with minimal adverse environmental impact.
3) Advise on the most useful and cost effective alternative(s).
4) Advise on the operational and maintenance requirements.

Problem identification or Phase 1 will study in detail sources, chemical characterization, collection and conveyance of wastewater, existing treatment and final disposal. Phase 1 will also gather information on current operation and maintenance practices, topographical and hydro-geological data of sewered and non-sewered areas of greater metropolitan Dhaka. Collected information in Phase 1 will be analyzed and evaluated in Phase 2. Specific alternatives will be proposed in Phase 2 including potential for centralized versus de-centralized services. Phase 2 will also advise the most suitable alternative(s) based on environmental, socio-cultural, operational and maintenance aspect to revitalize the current wastewater management system for Dhaka.

It is essential that we formulate a firm water policy for the city of Dhaka based on its projected growth by the year of 2050. The policy should address key issues like water demand, distribution network, source development, and protection and wastewater management. The policy should emphasize short and long term goals, development and acquisition of appropriate technologies for this sector. To limit scope, this proposal does not address the broader issue of potable water management or policy for the City of Dhaka, although it recognizes that an integrated approach is essential for sustainable development ensuring best use of our limited resources in this sector.

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