

How to improve the quality and impact of the environmental audits- Environmental Audit of Water Pollution in Beria Lake- Colombo Sri Lankan experience

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Background and Audit Planning

Water is one of the most important and precocious natural resources in the world. In Sri Lanka's water include man-made reservoirs, rivers, streams, ponds, lakes and marshes. Communities and individuals use water resources for drinking, sanitation, agriculture, industry, transportation, recreation and several other purposes. It is not sufficient merely to have access to water. The water also needs to be of adequate quality to support its intended use. Water pollution in the country arises from agricultural practices with extensive use of agro-chemicals and fertilizers, urbanization and industrialization; eutrophication and blooming in stagnant water bodies; nitrate pollution in ground water; spread of disease due to organic pollution; reduction of lands values near water ways and economic loss to the country due to incur cost for frequent cleaning-up.

The Beira Lake (BL) was constructed in 1521 by Portuguese period to defend the Fort of Colombo and it was a magnificent fresh water body in its colonial past. Beira Lake consist of four lakes namely Gall Face Lake, West Lake, South West Lake and East Lake. Deterioration of the Beira started in the latter part of the nineteenth century due to reclamation of the sections of the Beira for commercial development and with the use of the Beira to discharge municipal and industrial waste water. This is once an economic and esthetic asset and at present, the Beira Lake is essentially stagnant and is a polluted water body. The lake is seriously degraded the lake water quality, posing threats to human health and the environment, and forcing restrictions on activities such as swimming and fish consumption.

Objectives

The management and development of the Beira Lake is the responsibility of the Urban Development Authority (UDA). The objective of the audit was to determine whether the UDA and other agencies have succeeded in meeting established goals and objectives in preventing pollution of the Beira Lake. It was examined whether the agencies have understood the problems and had set clear priorities, established detailed 'plans' that define the expected results, and whether they were measuring and reviewing their own performance.

Audit Criteria

Whether the UDA and other agencies have clear roles and responsibilities and whether implemented such action plans in the areas of concern.

Our audit included examining whether UDA and other agencies have monitoring plans, reporting progress against expected results and making required adjustment in their implementation plan and whether they have taken remedial measures.

Our examination and testing included whether proposed ambient water quality standards for inland surface waters, Central Environmental Authority (CEA), 2001 and Organization for Economic Corporation Development (OECD) boundary values for open trophic classification system have adhered to.

Methodology

Our report reviews the scope of potential effectiveness of Beira Lake. The report focuses on the management of water quality in Beira Lake. This report draws wide range of sources of evidence, including meetings with managers and staff of the agencies, review of management information. The filed work for the report was assisted by staff of the Sri Lanka Ports Authority (SLPA) Laboratory, academic and consultancy reports available on this subject and INTOSAI-WGEA Guidelines.

Findings

The water quality status reveals that the water quality is deteriorating and has not been in accordance with the available proposed standards for fish and aquatic life.

The initial restoration program has not established the water quality norms/ values to be attained with the restoration. At the same time the restoration project did not have a systematic monitoring program to assess whether there is an improvement on water quality. The water quality data had not been collected by the UDA for monitoring the impact on quality during the post-project period.

The observations on lake condition and the outfalls opening to the lake (point source pollution) reveals severe deterioration of water quality and discharge of unmanaged urban waste. Effluent from the adjoining areas is a serious source of contamination that was not properly designed to treat the range of substances found in effluents allows them to flow in to the Beira water without adequate treatment. Further, the non-processed urban waters discharging in the tributary waters and after that in the lake as well as the discharge of liquid organic waste are the main sources causing the pollution of the tributary waters that discharge in the lake.

The bulk of run-off into the lake is provided by the rainfall which is highly variable due to monsoonal effects. More than twenty storm water outfalls opened into the South West Lake and many out falls opened into East Laka, contributing all forms of urban waste, particularly not worthy wastewater from laundries, service stations, garages, hotels and hospitals.

The attractiveness of the Beira Lake on recreational and social facility due to the light green colour of the water and odour emanating from it was a serious concern.

There are number of shanties around the East Lake and the shanty dwellers use the Beira as disposal site for garbage, raw sewage and waste water. Disposal of raw sewage and garbage disposal contribute to the nutrient and organic load entering the lake.

Organic pollution, fish kills and eutrophication in the lake are visually observed at many locations.

No measures have been taken to prohibit domestic or commercial fishing, or to establish the standard of toxicity of these fish for human consumption or to take measures to make fish suitable for human consumption.

SLPA dredged the East Lake before 2007 and mud (sediment) had laid around several corners of the Lake. SLPA had not taken any action to dispose removed sediments.

Removal of sediment and cleaning the BL could cost millions of Rupees, Solving this problems are critical in restoring the BL. Lack of enforcement of laws and non- enforcement of fines are the main problem.

There is lack of public awareness and involvement in understanding the campaigns due to non-maintenance of BL in accordance with accepted standards.

Ministry of Environment had not included in their sustainable development strategies any reference to the BL.

It is not clear how or when the remaining area of the Master Plan will be completed.

The institutions responsible for preventing of waste into the BL and their proper maintenance have not efficiently implemented.

Recommendations

UDA and other responsible agencies should focus on reducing pollutant loadings, mainly sewage, from the Beira Lake catchment area and creation of monitoring and enforcement programs. with particular attention to remedy the contaminated sediment and address the issues of overloaded municipal sewage systems.

Disconnection of unauthorized sewer lines, waste water discharging outlets into the BL.

All the toilets around the shanties which are directly opened to the lake should be removed.

Reducing phosphorus loading by waste and limiting phosphorous use in house hold detergents. Phosphorus is the principal inhabiting factor as it is the main element in algae growth. Therefore, phosphorus is the important matter for consideration in the future.

Prohibiting the release of some toxicants into the lake and reducing to an acceptable level of the amount of some other toxicant that could be released.

For restoration of the Beira Lake, sediment removable should be made very effective in preventing long-term phosphors released to control algal growth.

Dredging of the East Lake, Galle Face Lake and West Lake should be implemented.

A Comprehensive Strategy and Monitoring System to ensure the water quality standard should be determined, implemented and monitored.

Re -allocation of shanty dwellers is to be considered as priority work.

Effective implementation of environment laws, rules and regulations including imposing fines and policies governing wastewater and solid waste around the lake's shoreline and catchment area as a condition to eliminate the potential risk for the Beira ecosystem.

Public awareness programmes should be conducted to educate the public on the consequences of pollution and their impact. It has to increase the public involvement and educational level on environmental issues. The prevention of pollution via awareness is a much more effective and viable solution to pollution control.

Remaining area of the Master Plan should be implemented.

Adequate funding: UDA should negotiate funding with all the relevant partners (Colombo Municipal Council (CMC), CEA, and other stake holders) on case by case basis for infrastructure improvement.

Impact and results

The Chairman of the UDA reported that the main pollution source of Beria Lake is unauthorized settler located (more than thousands families) around the Beria Lake. Accordingly, action has now been taken to relocate them from these places. Ones this re-settlement programme is completed, most of the polluting factors identified by the writer will be stopped and expect to maintain Beria Lake as potential water source to the city.

The environmental aspect of the Beira Lake has important due to the action take to reallocate the settlers around the lake and it has become pollution free and used for Boat riding along the lake, floating restaurant by Five Star Hotel, floating market etc.

Challenges and barriers

The challenges we face include obtaining samples in different location of the lake, testing samples by reputed/accepted organizations. However, we were able to obtain the assistance of the staff allocated to the Sri Lanka Ports Authority Laboratory and for Water Analysis by National Building Research Organization. Further, the absence of adequate and up-to-date environmental monitoring data for decision making and deficient monitoring and reporting systems are another barrier.

Lessons learned

Need to have proper understanding among the institutions concern about the extent of damage to the environment leading to several problems unless arrest early. When we undertake this type of project the audit team should have multi-discipline skills. Otherwise it is necessary to obtain specialized services from reputed organization.

INTOSAI- WGEA Guidelines

It was a follow up on the initiatives undertaken by the International Organisation of Supreme Audit Institutions (INTOSAI) Working Group on Environmental Auditing (WGEA). The working group has provided guidelines, extensive information on water pollution and provided effective training on the auditing of environmental issues.

Sharing experience

Extent of damage due to environmental pollution if not remedial measure are taken.