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RESEARCH ARTICLE

RESTORATIVE MEASURES IN NIGEEN LAKE MANAGEMENT.

Shariqa Maryam.
P.G. Dept. of Environmental Science, S.P. College, Srinagar, Kashmir, India-190001.

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Abstract

The impact of anthropogenic pressures on Nigeen Lake is manifested via hydro-chemical deterioration and response of biological groups such as fish and invertebrates that are vulnerable and sensitive to such multiple-stressors. Freshwater is essential for endurance of life on earth, thereby making it our utmost priority to restore the glory of this resource.

This paper identifies the problems and highlights the restoration measures to combat adverse effects of excessive nutrient enrichment in Nageen lake. The measures are aimed to improve diversity and structure of biotic communities hence renovating its habitat quality.

Introduction:-

Lake restoration refers to a set of measures directed toward improving the water quality and rehabilitating its biota. All this requires identification of problem, awareness among masses and devising a socially acceptable cleanup strategy of lake and its watershed. There are many restorative measures which includes physical, chemical and biological methods. Lake restoration through chemical treatment does not benefit its overall ecology, it simply serves as a band-aid on an injury meaning temporarily masking the problem. Physical and biological methods are more effective in controlling the problem associated with lake management. However, the best way to restore a lake is via integrative approach which involves an amalgam of best available methods. In light of this following problem areas and subsequent restorative measures have been proposed to manage Nigeen lake.

The major contributory factor responsible for the pollution of the Nigeen lake is the sewage entering into the basin from the peripheral areas viz. Nigeen Bagh, Ashaibagh, Sadurbal, Lalbazar, Behrar, Botakadal the construction of an efficient sewage and drainage system with appropriate Sewage Treatment facility becomes inevitable. A garland sewer around Nigeen lake is proposed which shall culminate near Behrar STP from where it will be pumped to the Nallah Amir Khan after treatment. The proposed system will consist of 5 intermediate pumping stations which are required to lift the sewage at different locations due to the topography of the area, congestion of houses and narrow lanes. The proposed scheme covers a population of about 11874 persons till the year 2021. The estimated cost of the scheme is more than Rs. 10 crores, which includes sewage system, intermediate pumping stations and STP. The design of sewage system has been worked out for a combined system of sewage and drainage.

Since the houseboats in the Nigeen lake are disposing off all the fecal matters directly into the lake hence have become a constant source of point pollution of the lake. For houseboats sanitation a concept envisaged comprise a turn layered fiber glass floating septic tank with PU foam insulation for each houseboat. The liquid from this tank shall be carried through a low suction network of laterals and main sewers. The main sewer is proposed to be provided in the lake either on a bed or hung on bouys and having rigid laterals connected to the houseboats with

Corresponding Author:- Shariqa Maryam.
Address:- P.G. Dept. of Environmental Science, S.P. College, Srinagar, Kashmir, India-190001

flexible service pipe connections for taking care of varying lake levels and displacement due to wind sways. The maintenance of sewers is proposed to be ensured by providing two terminal main holes. Gravitational collection tank within the lake body where from the sewage is to be pumped to STP.

For solid waste management door to door collection system has been adopted to collect the solid waste from the houseboats and hamlets. A transforming station has been setup at the hamlet from where the solid wastes collected are carried by Srinagar Municipality. The solid waste collected from houseboats are carried to the shore a hamlet by boats for final disposal by the Municipal Corporation.

Ecological barriers, buffer zones are proposed for the purpose of development of peripheral areas and to give closed boundary to check the encroachments. The proposal envisages landscaping, construction of Parks and internal beautification of lake shores besides developing and landscaping of floating gardens.

The removal of illegal floating gardens and establishments within and on the periphery of the lake besides complete moratorium on construction in the green belt zone.

Development of the lake are for water sports and providing of infrastructure in the shape of jetties and bathing boats the proposal envisage a financial involvement of Rs.3.6 crores.

Improvement to Nallah Amir Khan outflow channel to enhance its carrying capacity. Nallah Amir Khan is an earthen channel and totals a length of 2180m. It also serves as a navigational route between Nigeen lake and Anchar lake. Since this channel has deteriorated over a period of time and subsequently the waterway of the channel has got restricted. The restricted condition coupled with reduction in carrying capacity has resulted in inundation of areas in and around Nigeen lake. In order to enhance the carrying capacity of the Nallah Amir Khan and to afford a better hydraulic control over it, remedial measures like construction of lock channel and flow control structure by way of a system comprising a weir and lock channel is proposed which would allow 37.66Cumecs under submerged conditions at high flood levels. During the normal level when there would be no flow through Nallah Amir Khan, a level of 1583m would be maintained at weir site allowing the surplus water to spill over the weir crest with gated control system.

Besides wire fencing is proposed at various reaches especially in the gorge portion for preventing disposal of solid waste into Nallah.

Balancing gates are also proposed near Amdakadal, Botakadal and Akmal bridge for facilitating the flow regulation and isolation of different reaches for conducting periodic repairs and cleaning operation after commissioning the channel.

In order to enhance the carrying capacity from 4.25Cumes to 37.66Cumecs and to achieve better navigability and drainability to prevent flooding and inundation of the hamlets a masonry lining and RCC raft foundation over a length of 16.10m and channelization of remaining 570m is also proposed, the entire program involves more 4 crores. The navigational routes to Syed kadal and Nehru park need to be dredged out to facilitate better navigation conditions.

Installation of aerators in the stagnant pockets of the lake to prevent algal blooms.

Systematic monitoring of the lake basin and compilation of the limnological data in order to establish a repository mechanism for future conservation measures.

Sometimes the best way to prevent a lake from pollution is by improving land use in catchment area, encouraging land protections programs which maintain the land in a non-degrading land use, this is beneficial for reducing the pollutant load entering the lake. Such programs should target the ecologically high priority sites and those most beneficial to the lake.

Systematic monitoring of the lake basin and compilation of the limnological data in order to establish a repository mechanism for future conservation measures.