

MANAGEMENT OF DAL LAKE

Jammu and Kashmir is gifted with numerous water bodies, Dal Lake being the most famous among them. Conservation of these water bodies has been a serious challenge for the State Government due to large scale encroachments, non-availability of funds and improper management. Although some progress has been made in the scientific management of the Dal Lake, other lakes in the valley have remained largely ignored.

Highlights

- The State Government had not conducted any survey for source water protection. A nodal agency for overall formulation, implementation and coordination of a comprehensive programme for pollution control in water bodies was not in place. (Paragraph: 1.3.7)
- There was considerable underutilization of funds ranging between 32 and 60 per cent during 2006-11 due to inaction of LAWDA to execute works like house boat sanitation, infrastructure development, etc. (Paragraph: 1.3.8.2)
- The DPR for conservation of the lake had not been prepared on the basis of an exhaustive investigation and survey. (Paragraph: 1.3.8.3)
- The performance efficiency of STPs was not up to the mark; as a result, 11.05 crore spent on installation of these STPs had remained largely unfruitful. Also, non completion of IPS and Sewer works/trunk sewer/remodelling of drains had resulted into non-optimal use of installed STPs (Paragraphs: 1.3.9.2, 1.3.9.3 and 1.3.9.4)
- Despite spending ₹ 70 lakh on pilot studies for management of solid/liquid wastes of population residing in and around Dal Lake, no considerable headway had been made on the sanitation front. (Paragraph: 1.3.9.5)
- Improper land use planning by LAWDA prior to acquiring land and delayed decision of the State Government to change the originally envisaged land-use had rendered ₹8.32 crore unfruitful, besides adversely affecting the rehabilitation and resettlement programme of the lake-dwellers. (Paragraph: 1.3.10)
- The monitoring by scientific advisory committee and Board of Directors was poor. Also, the internal control mechanism was virtually non-existent. (Paragraphs: 1.3.13 and 1.3.14)

1.3.1 Introduction

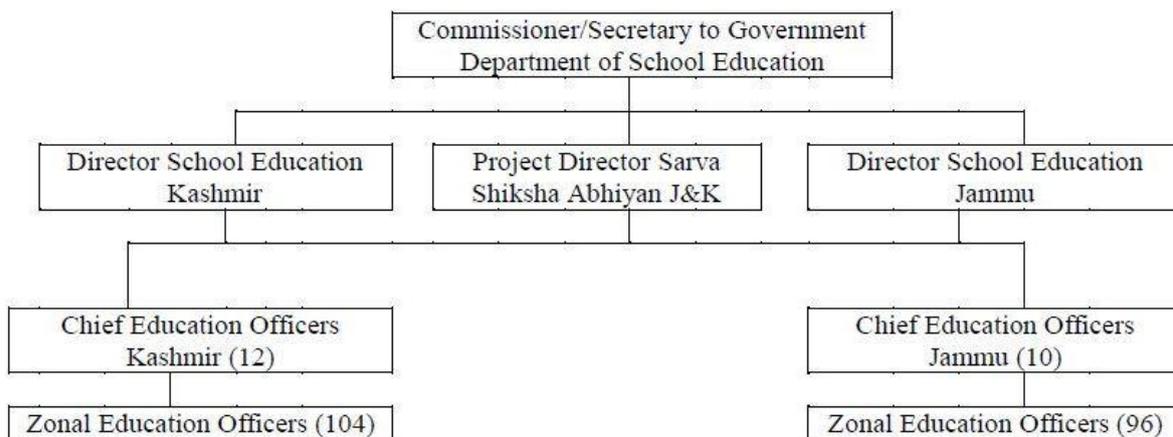
Lakes are not only objects of beauty but also a source of livelihood, recreation and economic activity. As potential sources of potable water, they are valuable national assets that need to be carefully conserved. Properly managed lakes can be a veritable blessing for the community living around them for all of the above reasons. The State of Jammu and Kashmir is gifted with 38 major water bodies that together cover 743 sq. kms of area. Many of these hold great ecological and socio-economic significance for the State. All except one of these water bodies belong to the natural category. The lakes constitute the backbone of tourism which is a key revenue earner for the State, Dal Lake being particularly notable in this regard. The largest lakes in the State are Pangong Tso,

Amto Gore and Tso-morari in Ladakh which are salt water lakes followed by Wular, Dal and Manasbal which are fresh water lakes. Wular is the largest in India with an area of 20 kms by 8 kms.

All the lakes in Jammu and Kashmir are being subjected to forces of degradation by anthropogenic activities. Different problems encountered in the lakes include excessive influx of sediments from the catchment areas, discharge of untreated or partially treated sewage and industrial waste waters/solid waste disposal, entry of diffused source nutrients from agricultural and forestry, improper management of storm water/combined with over abstraction, over-exploitation of lake for activities like recreation, fishing, encroachments, land reclamation resulting in lake shrinkage, shoreline erosion and impact on lake hydrology, deterioration in water quality and impact on bio-diversity, climate change etc.

The Government of Jammu and Kashmir created (March 1997) Lakes and Waterways Development Authority (LAWDA) under the Jammu and Kashmir Development Act, 1970 as an autonomous body, to serve as a one-point agency to look after, manage, and conserve the water bodies and water ways of the State of Jammu and Kashmir. LAWDA has a whole-time mandate to conserve and manage the Dal/Nigeen Lakes under National Lake Conservation Plan (NLCP) of the Government of India under the aegis of the Ministry of Environment and Forests (GOI). The organizational chart of the Authority is given in the following chart.

Chart-I



1.3.2 Audit Objectives

The objectives of the performance review were to assess whether:

- surveys were conducted for identification of lakes and an inventory prepared thereof;
- policies, regulations and strategies existed for addressing the conservation of lakes;
- programmes were planned, implemented and monitored to address the issues pertaining to the conservation and management of lakes; and
- Nodal agencies existed for the purpose.

1.3.3 Audit Criteria

Performance review was assessed against the following audit criteria:

- Lakes and Waterways Development Authority (LAWDA) Act
- Detailed Project Reports (DPRs)
- Guidelines prescribed by Government of India (GOI)
- Plans prepared by the implementing agency
- Prescribed monitoring mechanism
- Financial Rules

1.3.4 Scope of Audit

The performance review on 'Conservation and Management System of Lakes in Jammu & Kashmir' was attempted to assess the State's performance in planning, operating and monitoring the scientific management of its lakes, some of which have been victims of increased human interference over the years due to constantly growing population and failing civic management of the lakeside towns and cities. The review covered an evaluation of the policies and programmes of the Government for conservation of lakes in the State. Since, no comprehensive policy has been formulated for lakes in the State other than Dal; the scope of this performance review was confined to Dal Lake only.

1.3.5 Audit Methodology

An entry conference was held on 26 October 2010 with the Commissioner-cum- Secretary, Jammu and Kashmir Housing and Urban Development Department, Vice- Chairman and FA&CAO of the Authority wherein audit objectives, criteria and scope of audit were discussed. An exit conference was held with the Principal Secretary-cum-Commissioner, Housing and Urban Development Department on 13 October 2011 and points emerging out of the discussions have been incorporated in the review at relevant places.

1.3.6 Policies and Strategies

The Lakes and Wetlands are presently not covered by any specific legal statute but several legislations enacted till date have provisions for conservation of lakes. Some of these are The Forest Conservation Act (1980), The Wild life Act (1972), The Water (Prevention and Control of Pollution) Act (1974) and the Environment (Protection) Act (1986). Recognizing the importance of lakes, the Ministry of Environment & Forests, Government of India, launched the National Lake Conservation Plan (NLCP), a Centrally Sponsored Scheme exclusively aimed at restoring the water quality and ecology of the lakes in different parts of the country. The objective of the scheme is to restore and conserve the urban and semi-urban lakes of the country degraded due to waste water discharge into the lake and unique freshwater eco-systems through an integrated ecosystem approach.

The activities covered under NLCP were:

- Prevention of pollution from point sources by intercepting, diverting and treating pollution loads entering the lake. The interception and diversion works were to include sewerage and sewage treatment for the entire lake catchment area.
- In-situ measures of lake cleaning such as de-silting, de-watering, bioremediation, and constructed wetland approach etc. depending upon the site conditions.

- Catchment area treatment and lake front eco-development which was to include bunding, fencing and shoreline development, creation of facilities for public recreation and entertainment (Children Park, boating etc.) and public area.
- Solid waste management
- Prevention and pollution from non-point sources by providing low cost sanitation.
- Public awareness and public participation.
- Other activities depending upon location specific conditions including the interface with human population.

1.3.7 Planning

A comprehensive plan that would have involved, as a first step, inventorying systematically all the water bodies of the State to scientifically and effectively tackle the issue of lake conservation in the State should have been formulated. Such comprehensive planning would have enabled the State to formulate and phase appropriate action plans to restore the health, serenity and sanctity of polluted water bodies within a timeframe. The following shortcomings in policy and planning were noticed.

- The State had not conducted any survey for source water protection. Besides, complete study of lakes indicating the type, area, water volume, habitation, land-use in the catchment area, sources of pollutants, quality of water, etc. had not been prepared by the State at any point of time. Even assessment of critical risk parameters had not been carried out in respect of the major lakes except the Dal Lake. Accordingly, no comprehensive programme had been framed at any point of time to assess, monitor and control the pollution levels of the major water bodies.
- The State Pollution Control Board had been assigned (1987) the responsibility for prevention and control of water pollution issues in the State. It had confined its activities to testing the water pollution levels of Dal Lake only. With LAWDA restricting its activities only to Dal-Nigeen Lake by virtue of the State Government notification (1997), other water bodies in the State such as Wular, Mansbal, Anchar and Gilser lakes which had suffered significant habitat and water chemistry deterioration due to unhampered human activity, had remained unattended. Though programmes for conservation and management of the Dal Lake had been in operation for some years and another for Wullar had been launched in 2011-12, yet no programme for conservation and management of other lakes had been framed/ implemented by the State Government.
- To ensure effective implementation of the project, appointment of a Project Management Consultant (PMC) was a pre-requisite who would coordinate, plan and control (funding and execution) various activities undertaken under the Dal project. Despite lapse of over five years during which the programme had been under implementation, LAWDA had failed to appoint a PMC due to which the project had adversely suffered in terms of implementation of various components of the programme and consequently various performance evaluation parameters viz. water quality, animal life, etc. In reply it was stated that the consultant could not be appointed due to poor response to the tenders floated in this behalf.

1.3.8 Dal Lake Conservation Project

Among all the lakes of Kashmir, the Dal is by far the most famous- highly regarded by tourists for its serene beauty and by the locals for its rich agricultural produce also. The cultivators of the lake, known as Mirbahri, live on and by the lake and cultivate numerous vegetables of high quality in floating gardens known as radh and in lakeside plots known as demb. Rape-seed, maize, tobacco, melons, potatoes, onions, radishes, turnips, egg-plants, white beans, peaches, apricots, and quinces flourish on the rich soil of radh and demb. The lake also produces naturally singhara nuts jewar (*Euryale ferox*), and bumbh Bumbh, with its long stem and white flower, provides a nourishing vegetable from the former and an agreeable sharbat from the latter. The size of the lake has been mentioned as 6.4 kms long and 4 kms wide where it is the broadest in some early texts. Besides the springs of the lake itself, the Lake is also fed by a stream which comes from the Marsar Lake high up in the mountains. In its lower course where this stream approaches the north shore of the Dal, it bears the name of Telbal Nallah. The lake is also fed by other smaller streams. The threat of the lake silting up with the deposit brought forth by these streams and the floating gardens (radh) extending all over the lake has been recognized since a long time past.

1.3.8.1 Programme Management

With a view to improving water quality of the lake and also saving it from further degradation, the State Government launched (1977) the Project 'Conservation of Dal- Nigeen Lake'. The work on the project was got executed through the State Urban Environmental Engineering Department (UEED). The Dal Lake Conservation Programme was approved and included in NLCP (2005-06) by MoEF, GOI with a view to addressing the problem areas by way of:

- reduction in volume of silt caused due to catchment area degradation and increased pollution due to increasing number of lake-dwellers;
- stoppage of untreated sewage and solid waste from peripheral areas, hamlets and house boats, agricultural return flow from catchment, etc. into the lake;
- controlling the reduced circulation of lake water due to reduction and clogging of water channels within the lake;
- improvement of fresh water inflow into the lake;
- enrichment of the lake water by removal of nutrients to avoid excessive weed growth and adverse changes to the bio-diversity of the lake; and
- Creating a data bank.

The DPR for Dal Lake Conservation and Management Programme was prepared (October 1999) by Alternate Hydro Energy Centre, (AHEC) of the Indian Institute of Technology, Roorkee and submitted (December 2002) to MoEF.

The project of Conservation and Management of Dal Lake was sanctioned (September 2005) by the GOI under NLCP at an estimated cost of ₹ 298.76 crore and targeted for completion in March 2010, subsequently extended to March 2012. The Rehabilitation and Resettlement Programme was approved (May 2001) by the State Government at an estimated cost of ₹ 135 crore revised to ₹ 442 crore in 2007-08. After inclusion of the lake under NLCP, the Authority spent ₹ 308.43 crore during 2005-11.

1.3.8.2 Financial Management

Before the programme was brought under the NLCP, the conservation programme of the Lake was being looked after by the State Urban Engineering Department (UEED) which spent ₹72 crore on the development activities of the lake upto 1996-97. LAWDA, after coming into existence, spent a further amount of ₹119.43 crore from 1997-98 to the end of March 2005.

The position of funds released and those spent on the project during the last six years after the activities of the Lake were brought under NLCP was as under:

Table 1.3.1

(₹ in crore)						
Year	Opening Balance	Funds Received	Total	Expenditure	Closing Balance	Under utilization (%)
2005-06	11.07	52.12	63.19	43.26	19.93	32
2006-07	19.93	44.00	63.93	34.07	29.86	47
2007-08	29.86	82.54	112.40	44.76	67.64	60
2008-09	67.64	30.50	98.14	55.11	43.03	44
2009-10	43.03	74.01	117.04	67.79	49.25	42
2010-11	49.25	48.94	98.19	63.44	34.75	35
Total		332.11		308.44		

As can be seen from the table, the implementation of the programme was sluggish in the initial stages of its execution under NLCP as huge funds ranging between 32 and 60 per cent remained unutilized during 2005-10. The under-utilization was mainly due to inaction of LAWDA to execute various works like houseboat sanitation, infrastructure development, construction of water tanks in the catchment area, construction of a canal for carrying of fresh water to lake, resettlement of Dal-dwellers etc. The Vice-Chairman (VC) attributed underutilization of funds (September 2011) to unfavourable conditions in the valley, land disputes and non-cooperation of houseboat owners.

1.3.8.3 Preparation of DPR

The State Government in December 2002 approved the DPR which was got prepared by the MoEF through Alternate Hydro Energy Centre (AHEC), Roorkee. Audit observed that later in December 2003/January and March 2004, LAWDA had pointed out some discrepancies to AHEC. However, it was also noticed that the deficiencies had not been pursued by LAWDA vigorously with MOEF for their effective resolution. It was also seen that phasing of the components of the work to be undertaken under the programme had not been made in the DPR. The Vice Chairman stated (S September 2011 that formulation of a comprehensive DPR was a challenge owing to involvement of multiple disciplines associated with it. It was stated that the discrepancies were pointed out to the firm in 2004 but the GOI sanctioned the project in 2005 after evaluating all pros and cons which was subsequently given a go-ahead by the State Government. The Authority in view thereof was left with no option but to implement the project.

1.3.9 Implementation

The project included two components viz. 'Lake Conservation & Management Programme' and 'Rehabilitation & Resettlement Programme'. Salient aspects of the programme are:-

a) Lake Conservation & Management Programme: The works under the programme include Sewerage Treatment, Hydraulic Works, Restoration and Development Works, Solid Waste Management, Infrastructure Development and Catchment Management including provision for Land Acquisition and Public Awareness.

b) Rehabilitation & Resettlement Programme: The programme includes resettlement of the dislocated hamlet population in new colonies and acquisition of watery area surrounding the hamlets.

The status of various activities undertaken covered under the programme are enunciated in the succeeding paragraphs.

1.3.9.1 Conservation and Management Programme

The programme includes Sewerage Treatment, Hydraulic Works, Restoration and Development Works, Solid Waste Management, Infrastructure Development and Catchment Management including provision for Land Acquisition and Public Awareness. The status of the works undertaken under various components of the programme is discussed hereunder.

1.3.9.2 Sewerage Treatment Works

Sewerage Treatment Plants (STPs) are designed for removing impurities present in waste water in the form of floating material, suspended solids, bio-degradable organics and 25 pathogens. Six STPs estimated to cost ₹ 21.45 crore were projected to be constructed in the DPR. Out of these, three STPs were taken up in the first phase at a cost of ₹ 9.30 crore. The construction of two STPs (Brari Nambal and Nala Amir Khan) was under progress as of March 2011 and STP at Hotel Welcome was amalgamated with the one at Brari Nambal. Audit check of the execution of this component of the work revealed the following:

- Despite the doubts expressed by the Ministry of Urban and Poverty Alleviation, GOI over the effectiveness of these treatment plants in cold conditions and the sustainability of their huge maintenance cost, the construction work of the STPs was allotted (August 2004) by LAWDA to M/S Thermax at a cost of ₹8.90 crore (Habak: ₹2.42 crore, Laam: ₹2.82 crore and Hazratbal: ₹3.66 crore) for completion in nine months. The STP at Hazratbal, Habak and Laam were commissioned in February 2006, April 2006 and October 2006, respectively with time overruns of nine to 17 months. Tests of outflow of the two (Hazratbal, Habak) STPs conducted (August 2006) by LAWDA, however, showed that despite receiving treatment, the concentration of nutrients present in the waste water had increased at the outflow stage vis-à-vis inflow stage. As already brought out in the report of the Comptroller and Auditor General of India for the year ended March 2006 the percentage efficiencies of the STPs had ranged between 63.39 and (-) 366.3. Further, tests/monitoring (October 2008, March 2009 and January 2010) by the Authority had confirmed the increase in the nutrients at the outflow stage which was indicative of the fact that the STPs had not been functioning to the desired levels. Other parameters which define the purity of water too were inadequate and did not match the prescribed norms of the NIT. The aggregate amount of ₹ 1.05 crore (Habak: ₹ 3.13 crore, Hazratbal: ₹ 4.36 crore and Laam: ₹3.56) spent on construction of these three STPs had, thus, proved counter-productive for the health of the lake.

The VC while admitting (September 2011) that Ammonical Nitrogen and phosphorous contents had been found to be inconsistent stated that the firm had been directed to optimise the process to



Swerage treatment chambers of STPs without covering/roofs.

achieve the desired results. No steps had, however, been taken to arrest the problem. The Scientific Advisory Committee (SAC) of LAWDA which was concerned over the functioning of the STPs, decided (June 2009) either to install de-nitrification units for the STPs or create artificial wetlands. The fact remains that the decision to install the de-nitrification plants or creation of the artificial wetlands had to be taken in view of improper functioning of the STPs not provided in the DPR. It was also seen that the firm had also not conducted any internal assessment of the sewage characteristics to modify the design of STPs so as to ensure that the plants were able to function to the desired extent as per agreed terms. The payments made to the firm in view of the stipulation in the NIT regarding payments to be made to the agency after satisfactory performance of the STPs were questionable. The reasons, though called for, were not furnished. An on-the-spot verification of the three completed STPs showed that sewage collection chambers in all three STPs were without any covering/roof causing air pollution and foul smell. The VC in reply stated that providing of covering /roof was not provided in the NIT/contract and were not required at all. The reply was not acceptable as during a spot visit to the area it was found that the sewage collection chambers were emitting a very foul smell.

Keeping in view the environmental concerns of the lake, Audit is of the opinion that a disaster management system should have been in place to overcome the problem that would arise in the event of the STPs becoming non-functional owing to power/machine failure, technical fault, etc. It was, however, seen that no planning was done by LAWDA to meet any such eventuality. In reply the EE while appreciating the audit suggestion stated that steps would be taken in that direction.

1.3.9.3 Intermediate Pumping Stations/Sewer Works/Trunk sewers/re-modelling of drains

To overcome the problems where sewer lines had been laid so low that they could not be re-laid from practical or economic consideration, construction of 11 Intermediate Pumping Stations (IPs) estimated to cost ₹ 8.78 crore was proposed in the DPR. Out of these, only six IPs had been completed at a cost of ₹ 8.60 crore during the last seven years with physical and financial progress of 55 and 46 per cent respectively. No phasing had, however, been included in the DPR vis-a-vis completion of the involved components. Similarly, against 63,000 meters of sewer lines/trunk sewers/remodelling of drains estimated to cost ₹ 35.66 crore, only 49656 meters of sewer lines/trunk sewers/remodelling of drains had been laid at a cost of 30.25 crore up to March 2011 with physical and financial progress of 79 and 85 per cent respectively. The incompleteness of IPs and Sewer Works/Trunk Sewers/Remodelling of drains had resulted into non-optimal use of installed STPs. The shortfall in execution was attributed by the EE to unrest in the valley, short working season and non-preparation of tender documents for these works by the AHEC which formulated the DPR. It was also stated that the tender documents had been prepared by the LAWDA to ensure completion of the work.

The chances of completion of the Sewer lines/trunk sewers/remodelling of drains within the project period; i. e. March 2012, appeared remote, particularly, because in many instances the works had been allotted to contractors without acquiring the land falling in the sewer/drain alignments. Due to this either the works had not been taken up by the contractors or were abandoned after spending huge funds thereon. In one such case {sewer line for sub-zone C01, C02, C03 and C04 of zone 1 (C)}, the contractor after spending ₹36.38 lakh on the work abandoned (March 2009) it as the owner of the private property demanded compensation for allowing the passage of the proposed sewer line through his land. In another such instance, construction of sewer line for sub-zone C04, C05, C06 and C07 of zone 1 (C) along Nigeen fringe from RD-1011 to RD-1684 Mtrs could not be taken up for execution by the contractor for the same reason. On this being pointed out, the EE, LD-II stated that the land owners had created hindrance during execution of the work for want of land compensation/non-clearance of land use and that after the land was acquired the contractor asked for escalation or fore-closure of the contract. The contracts were accordingly fore-closed and balance works retendered. The reply of the Authority reflects a casual approach in allotment of works without ensuring availability of encumbrance-free site which is tantamount to improper planning. The Vice Chairman of the Authority stated (September 2011) that the land disputes had been resolved and work was expected to be completed soon.

1.3.9.4 House- to- house connectivity

Construction of lateral sewers for house-to-house connectivity to receive sewage for treatment plants though vital to the programme was not included in the original DPR of Dal Lake Conservation Programme (DLCP). The action of State Government/Authority in not properly evaluating the DPR before accepting it without the vital component of house-to-house sewer besides bringing the casualness of LAWDA to the fore also deprived the State/project of the sustained flow of funds from the GOI. Hence, a separate DPR, estimated to cost ₹ 55 crore, revised to ₹ 60.20 crore, with a target of 77,805 running meters of Secondary/Lateral Sewer/house-to-house connectivity, was framed (2004-05) for funding by the State Government. Against the target, LAWDA had laid 59,973 (77 per cent) running meters of Secondary/Lateral Sewer lines at a cost of ₹ 44.70 crore as of March 2011. However, due to inadequate execution of house-to-house connectivity related works, STPs were not receiving the quantum of sewage for which they had been installed resulting in non-optimal use of the sewerage network and STPs so far. Inadequate

house-to-house connectivity had also resulted in sewage from households finding their way into the lake. Under-utilization of sewerage network and sewerage treatment plants had also been pointed out (July 2009) by the MoEF team.



1.3.9.5 Houseboat Sanitation

Besides, the peripheral area of the lake, human settlements residing within the lake in 1094 houseboats and 2800 shikaras and hamlets also contribute to generation of solid and liquid wastes of ₹ 4.80 lakh kilograms and 49.91 million litres annually. Though LAWDA undertook a number of experimental projects to rectify the problem prior to NLCP and also spent ₹0.70 crore on pilot studies (2005-11) under NLCP, none of the studies could provide any viable solution (March 2011). Despite the omission having been pointed out in the CAG's Audit Report for the year ended 31 March 2006, nothing had been done to arrest the flow of unwanted wastes into the water body. The team of MoEF (July 2009) also felt concerned and pointed out that the land mass behind the houseboats, used for the housing of the staff, was causing stagnation of water and supporting growth of dense vegetation thereby deteriorating water quality of the lake. On this being pointed out, the EE, LD-I stated that a decision had been taken to relocate all the houseboats at one place (Dole-Demb area) where they would be provided sewer links for treatment of the waste at the nearest STP. The VC stated that the decision regarding relocation of houseboats at Dole-Demb had been taken by LAWDA on the directions of the Hon'ble High Court, J&K. The VC in his reply, however, refuted the figures brought out in the review and claimed that these were highly exaggerated. The reply was not tenable as the figures brought out in the review were based on the details incorporated in the DPR.

1.3.9.6 Hydraulic Works

With a view to arresting flow of sediments from the Nallahs, catchment areas and melting glaciers flowing into the Lake a settling basin had been constructed but a diversion weir had not been constructed. The DPR among other things included construction of diversion works of Telbal Nallah, balance works of Nallah Amir Khan and extension of Padshahi canal to the lake which had been estimated at ₹12.83 crore. During check of the records related thereto, following significant points came to the notice of Audit.

- To arrest flow of sediments from entering into the lake, a settling basin had been constructed in 1997-98. It was, however, observed that settling basin had been able to retain sediment load ranging between 42 and 50 per cent only as detailed in the table.

Table 1.3.2

Year/Month	Average inflow of sediment load (mg/l)	Average outflow of sediment load (mg/l)	Retention of Sediment Load (%)	In-efficiency of settling basin (%)
9/2005 to 8/2006	153	73	48	52
9/2006 to 8/2007	143	71	50	50
9/2007 to 8/2008	24	12	50	50
9/2008 to 8/2009	17	8	47	53
9/2009 to 8/2010	24	10	42	58

Inadequate capacity of the settling basin to retain the inflowing quantum of sediments from the catchment areas and consequential flow of sediments into the lake beyond the retaining capacity of the basin meant that the decrease in the depth of the lake, increase of nutrients in the lake bed with nutrients and consequential increase in weeds, etc. could not be arrested as envisaged. It was noticed that an inspection team of MoEF had noted (July 2009) that new habitations were coming up in the catchment area especially along the water courses and liquid/solid wastes from such habitations were getting discharged directly or indirectly into the lake thereby, polluting it. Despite knowing to this phenomenon and despite having a full-fledged Enforcement Wing, the Authority had not been able to stop constructions in the catchment area. Reasons therefore, though called for, were not furnished. The VC stated that monitoring of the surface water only was being done initially which conversely should be measured on bed load as well.

- One of the components included in the DPR under 'balance works' was construction of a diversion weir for the settling basin which would help the settling basin perform better through the gates constructed thereon which would prevent muddy waters from entering the basin during floods. It was noticed that against the approved cost of ₹6.17 crore, an amount of 3.05 crore had been spent with a physical achievement of 99 percent as of March 2011. The physical and the financial progress had not been commensurate and it was seen that the expenditure incurred had not proved fully effective due to non-construction of a gate on one of the constructed bays due to which a large part of flood water entered the lake directly instead of through the settling basin as intended. This problem was also highlighted (July 2009) in its report by the monitoring team of GOI. LAWDA did not reply to the audit observation.
- To improve water budget of the lake during lean period (June-July) and help flushing of the lake by bringing additional two cums of water per second from Sindh Nallah through Padshahi Canal to the lake ₹ 2.61 crore had been earmarked in the DPR. After spending ₹ 35.26 lakh between 2003 and March 2008, progress could not be made as the Irrigation

Department informed (December 2009) LAWDA that the project was not technically viable. The Monitoring Division of LAWDA also did not find the project viable on the grounds that it carried high load of nutrients of Nitrogen and Phosphorous. As a result, the entire expenditure of Rs.35.26 lakh incurred so far has been rendered wasteful. This was indicative of the fact that the DPR had not been properly evaluated before implementation. No efforts had been made by LAWDA to find an alternate solution, thus, depriving the lake of additional fresh water which could have also helped its flushing.

1.3.9.7 Restoration and Development

One of the components of Conservation and Management Programme was 'Restoration and Development Programme' approved at a cost of ₹49.62 crore. Main activities of the component were dredging of the blocked channels, de-weeding, creation of reed belt, development of shoreline, establishment of aerators and carrying of fresh water from streams to the lake etc. The purpose of these activities was to improve water circulation, increase aesthetic beauty of the lake and further eco-tourism and revenue earnings. With regard to this component following significant points were noticed.

- With a view to improving hydrology of the lake for creating a positive impact on the water quality and longevity, the DPR had recommended dredging and deepening of 38 blocked channels in the backwaters of the lake at an approved cost of ₹5.81 crore with a physical target of 81833 cum and also dredging and de-weeding of the lake at a cost of ₹14.52 crore for completion within the project period. While 22 per cent physical and 68 per cent financial achievement had been made in dredging in the blocked channels at a cost of ₹ 3.94 crore, the Authority had spent ₹16.54 crore on de-weeding/ dredging of the main lake by the end of March 2011. Assessment studies had not been carried out to analyze the impact of dredging and de-weeding on the lake ecology including invasion of species both in the dredged part and the hinterland where the sedimentation had occurred. The team of MoEF had also noticed (July 2009) inadequate execution in dredging of channels of the lake and dredging of the lake without bathymetric map (Map that shows basin morphology and helps with identifying areas to be dredged). On this being pointed out, the EE attributed (August 2011) the delay in completion of this component to unrest in the valley. Regarding monitoring and evaluation studies it was stated that it was not possible to ascertain the impact of execution at this stage unless all the components of the project were completed. It was further stated that these studies would be conducted in future. The expenditure of ₹ 20.48 crore (blocked channels: ₹ 3.94 crore; lake: ₹16.54 crore) incurred on this component had so far not led to the desired outcome. The water quality of the lake had not shown any improvement yet, species of local fish had dwindled and exotic species had invaded the lake as discussed in the succeeding paragraphs.

- With the objective of acquiring land, developing tourist related facilities, raising its means of finances, etc. a component viz. 'shoreline activity' was approved in the DPR at a cost of ₹22.04 crore. The Authority had spent ₹8.46 crore with financial achievement of only 38 per cent during the last over five years under shoreline development which included fencing of the northern foreshore road, landscaping and development of a park and construction of viewing points. The main components viz. clearance of settlements which had grown close to the Northern foreshore, construction of boat club at Telbal, pedestrian Mall at either side of Telbal Nallah, roadside Arboriculture, Time share resort, camping sites, craft bazar, mini zoo etc. had not been taken up by the Authority. Given the present scenario, the chances of

completion of this component of project by March 2012 seemed remote. The non-completion of the component of work was attributed by the EE to short working season and unrest in the valley.

- Conveyance of fresh water from 57 springs located outside the lake periphery was one of the activities provided in the project and the cost of this activity was estimated at ₹2.89 crore. An amount of ₹ 1.57 crore had been spent (financial progress: 54 per cent; physical progress of 74 per cent) on this activity on 42 springs as of March 2011. No studies had been carried out to ascertain whether these springs actually carried water to the lake or had choked. This aspect was also highlighted (July 2009) by the monitoring team of the GOI in its report. In reply the EE, LD-I stated that the issue of analyzing the impact of restored springs would be taken up with the Research and Monitoring Wing of LAWDA. It was also stated that the delay was due to unrest in the valley and that the balance work would be completed within the project period.

1.3.9.8 Catchment Management Works

The main objective of the project was to check soil erosion and degradation process in the catchment area of 33,700 hectares with a perimeter of 93.70 kms (maximum width of 16.70 kms) by reducing inflowing silt load of 60,877 tons per year by 60 to 70 per cent. The component was to cost ₹ 25.84 crore. The activity under this component included catchment treatment in identified zones, limiting the building activities in the uphill catchment area, restoration of degraded forests through massive plantation, drainage line treatment through properly designed structures enforced by vegetative measures, fuel wood and fodder plantation of indigenous and exotic species in State and village common lands, supporting private efforts of raising plantations, forage production through silvi-pasture, pasture development and on-farm fodder development, beneficiary participation through entry point activities, stabilization of quarry area etc. LAWDA had spent ₹14 crore on watershed activities on this component as of March 2011. One of the vital activities of the component was to plant 31.15 lakh plants in 5,545 hectares at a cost of ₹ 8.65 crore. Against this ₹2.73 crore had been spent on planting 13.35 lakh plants on 1,563 hectares (physical achievement of 43 per cent under plantation and 28 per cent under land cover with financial achievement of 32 per cent) of catchment area as per the progress report of LAWDA. In the report submitted by the Project/Watershed Manager, the survival rate of plantation ending September 2011 was placed at 53.71 per cent.

To ascertain the impact of plantation on reducing the soil erosion, a silt-monitoring station (SMS)/observatory for gauging runoff had to be launched. No such station/observatory had been launched as of March 2011. In the absence thereof, the inflow of silt from the catchments area and the reduction in the flow of silt into the lake could not be assessed. The team of MoEF also felt concerned over the slow progress of catchment works. On being pointed out, the Water-shed Manager of LAWDA disputed the figures included by the FA&CO in the progress reports and claimed that target had been achieved up to 75 per cent (12.12 lakh against 16 lakh plants). It was also stated that it would take steps to lay SMS at the appropriate time of project completion. The reply was not acceptable as laying of the SMS was a pre-requisite to enable assessment of the impact of treatment meted out to the catchment area by way of plantation etc. for possible mid-term corrections. The VC in his reply put the targets at 16.50 lakh plants on 1500 ha out of which ₹13 lakh had been statedly planted on 1102 ha which was also at variance with the figures provided by the Watershed Manager. The variation between the three sets of figures was not explained.

1.3.9.9 Evacuation of hamlet population

The Lake Conservation Programme envisaged acquisition of 58 hamlets (over 6000 kanals) alongwith 3741 structures erected thereon and restoration of the area so evacuated to the Lake. It was observed that only 1073 kanals of land (18 per cent) and 592 structures (16 per cent) had been acquired (March 2011) at a cost of ₹84.19 crore. It was also observed that the area had been acquired at isolated spots in a sporadic manner instead of in clusters without demarcation of the acquired land, masses and also, no physical verification was carried out by LAWDA to ensure that the land acquired had not been encroached upon. As a result, despite spending ₹84.19 crore, the programme objectives could not be achieved in full rendering the expenditure largely unfruitful. The omission had also been pointed out in the CAG's Audit Report for the year ended 31 March 2006. The EE, LD-I attributed it to non-settlement of compensation with the lake-dwellers under private negotiations. The reply was not acceptable as in a huge number (66 test-checked) of cases, though the mutations/sale deeds and acquisition of land had taken place yet payments had not been made to the lake-dwellers.

1.3.10 Rehabilitation and Resettlement Programme

The programme includes resettlement of the dislocated hamlet population in new colonies and acquisition of watery land surrounding the hamlets. Against the availability of ₹191.60 crore for the component, the total amount spent was ₹157.23 crore during 2005-11 and the unspent balance was ₹ 34.37 crore at the close of March 2011. The status of the activity is given in the succeeding paragraphs.

- The rehabilitation programme related to Dal Lake Conservation and Management Project envisaged relocation of Dal-dwellers residing in hamlets within the lake. The programme aimed at rehabilitation of about 6,000 families residing aboard 58 hamlets (1999) within the lake body. The number of families had subsequently (July 2005) increased to 11,000. The State Government had approved (May 2001) the project for ₹135 crore, revised (September 2005) to ₹ 264.85 crore and further revised (2006-07) to ₹ 442.70 crore. To relocate the affected people, land measuring 581 kanals was acquired upto October 2003 by LAWDA at Guptaganga and Chandpora at a cost of 8.32 crore. The land was, however, not allotted to the Dal-dwellers as these sites were shown to be green belt areas in the Master Plan of Srinagar city. Though proceedings for change of land-use were initiated time and again, the cabinet did not approve the change. The State cabinet approved (October 2008) the change of land-use from restricted open land to tourist and residential activities after a lapse of more than four years. Improper planning of LAWDA to ascertain the genuineness of the use of the land prior to its acquisition and delayed decision of the State Government to change land-use had rendered the expenditure of ₹ 8.32 crore unfruitful, besides adversely affecting the rehabilitation and resettlement programme of the lake dwellers. The land in question had not been put to fruitful use so far.

Before the decision regarding the land-use could be taken, the State Government had transferred 7,526 kanals and 7 marla of land at Rakh-i-Arth, Budgam to LAWDA in April 2006. The colony was proposed (March 2008) to be developed at a cost of ₹402 crore in a phased manner. In the first phase, 3,000 kanals of land was decided to be developed to accommodate 4600 families. LAWDA had, however, taken possession of only 494 kanals (out of 7526 kanals) of land at a cost of ₹ 34.68 crore (includes payment to Kamas, development charges etc.) as of March 2011. Besides, the environmental impact assessment (EIA) study of the area on which Dal-dwellers were to be relocated was also pending. All the components of the project had to be implemented simultaneously as per the DPR but had not been done. Evidently, LAWDA was not able to

rehabilitate Dal-dwellers since the implementation of the Dal-lake Conservation and Rehabilitation Programme. Thus, the purpose of the project had been defeated as the sewage of these inhabitants had continued to be discharged directly into the lake body. The team of MoEF had also pointed out that the rehabilitation project was moving at a slow pace .

Land acquisition

The Dal dwellers had proprietary rights of watery land within the lake. To prevent the dislocated dwellers from returning to the lake and filling up this watery land for residential/agricultural purposes, it was proposed (January 1999) to acquire 14,547 kanals of watery area under the Rehabilitation Programme. However, against the target of acquiring 14,547 kanals , only 3907 kanals (27 per cent) had been acquired as of March 2011. It was also observed that the area had been acquired at isolated spots instead of in clusters without demarcation of the acquired land masses and also no physical verification was carried out by the Authority to ensure that land acquired had not been encroached upon. As a result, despite spending ₹40.71 crore, the programme objectives had not been achieved in full rendering the expenditure largely unfruitful. The omission had also been pointed out in the CAG's Audit Report for the year ended 31 March 2006. The team of MoEF (December 2010) had also felt concerned over the slow progress in this particular component. In reply, the EE stated that the land would be acquired in clusters and matter of demarcation and physical verification would be taken up with the field staff. The fallout of non-completion or partial completion of the components of the conservation and rehabilitation programmes had been manifold as brought out hereunder.

- **Entrapping of phosphorous and inorganic nitrogen**

156.62 tonnes of phosphorus and 241.18 tonnes of inorganic nitrogen flows into the lake annually as part of sewage, soil from erosion, agricultural back flows, etc., from non-point/point sources out of which about 80.62 tonnes of phosphorus and 109.22 tonnes of inorganic nitrogen leaves the lake, mainly through two outlets, resulting in entrapping of about 76 tonnes of phosphorus and 131.96 tonnes of inorganic nitrogen in the lake annually. The gradual increase in the levels of nutrient load meant accelerated eutrophication of the lake and was an issue of foremost concern. LAWDA had not carried out any studies to assess the impact of eutrophication or set up formal mechanism for regular monitoring of such eutrophication.

- **Dwindling of local fish species**

It was seen that notable fish species common in the Lake like schizothorax, Socinus, s. Niger, s. curvifrons, s. micropogon, labeodera, and carassius carassius had decreased sharply over the last thirty years and had since been outnumbered by carpiodes. It was further seen that the two fish species, viz. cyprinus carpio specularis and c. carpio communis, introduced in 1956 had got well established as they thrived in waters rich in nutrients and organic matter. The Ex-Director of Research and Monitoring Laboratory had researched that the fish catch of Dal Lake comprise more than 80 per cent of the introduced carp. The decline in fish diversity and yield was attributed to the changes in hydrological regime and loss of critical habitats and heavy loads of incoming sewage which had led to increased eutrophication with adverse impact on growth and development of sensitive fish species.

- **Invasion of exotic species**

Azolla, the exotic species of weed was a new invader that had consumed the greater area of the lake causing significant changes to its vegetation pattern. The prolific growth of azolla was attributed

to unabated inflow from effluent channels and drains, raw sewage and enrichment of sediments particularly due to heavy load of organic nitrogen and phosphates.

1.3.11 Infrastructure

A provision of ₹15.93 crore had been sanctioned for creation of infrastructure facilities for the Project viz. establishment of buildings for Authority, its laboratory, purchase of equipment, installation of captive power plant, etc. Despite the provision for establishment of office building, LAWDA had continued to house its offices in rental accommodations paying huge rent annually thereby resulting in avoidable expenditure of ₹0.47 crore from September 2003 to June 2010. Utilization of money on payment of rent out of the funds meant for creation of infrastructure is tantamount to diversion of the project funds. The VC attributed it to non-availability of suitable land. The team of MoEF had pointed out (July 2009) that equipping the Authority with the needed infrastructure was the basic requirement for effective implementation and monitoring of works and for evaluating the status of the lake, as also for undertaking research that was considered necessary for management of interventions. The team had noticed meager expenditure under infrastructure facilities and had further noticed that the laboratory of LAWDA which earlier had its own building was housed in a small rented space which was ill-furnished, ill-equipped and poorly staffed. The team had concluded that unless the infrastructure was provided, it was neither possible to implement the scheme properly nor undertake regular field works for collection of samples for physico-chemical analysis and monitoring. Audit noticed that not much progress had been achieved in this regard.

1.3.12 Human resources development

Human resource management is one of the basic ingredients for an organization to run efficiently and effectively. It was, however, seen that human resources development by means of training and capacity building had not been undertaken by LAWDA fully as prescribed in the DPR. The organizational set-up as proposed in the DPR for LAWDA had not been replicated by the State Government. Except for the appointment of a Chief Executive Officer, though not of the rank prescribed in the DPR, none of the five Directors had been appointed in the Authority to oversee various components/activities of the project work as the rules regarding service of the employees were pending approval of the State Government. The laboratory of LAWDA had remained head-less during the entire period of NLCP. Also, the LAWDA-borne staff had stagnated for nine years or more and not given in-situ promotions despite a decision having been taken by the Board. Training programmes were also not conducted for the staff to handle/run equipment such as STPs etc. The VC stated that draft recruitment rules and the issue of in-situ promotions to the employees were under consideration in the Administrative Department.

1.3.13 Monitoring

Effective monitoring at all stages of execution of a project is essential for carrying out mid-term corrections and for overall progress in the intended direction. It was, however, seen that the monitoring mechanism was non-existent which had resulted in non-completion of the project and also ineffective functioning of the components of work already executed. The position of monitoring system available or lack of it is brought out hereunder.

Monitoring by State Level Monitoring Committee

The implementation of the project was to be monitored by the State Government and the GOI. A Monitoring Committee was to be set up to monitor and evaluate the work done on quarterly basis i.e. four times a year starting September 2005. The committee had met only once (January 2007) against 22 meetings due to be held between September 2005 and March 2011. This had resulted in non-monitoring and non-evaluation of the work done under the project and consequential impairment in the implementation of the project.

Monitoring by Scientific Advisory Committee

A Scientific Advisory Committee was to be constituted to oversee various aspects like aquatic ecology, hydrobiology, environmental engineering, chemical engineering, hydraulic engineering/hydrology, watershed management, economics, sociology, etc. The Committee was to meet periodically, at least twice a year (i.e. at least 11 times from September 2005 to March 2011), to assess the impact of the various ongoing measures taken by Authority in implementation of the Dal Lake Conservation Programme. The Committee had met only twice since September 2005 which had led to non-monitoring of the project.

Board of Directors

The Board of Directors which had to meet at least 18 times during 2005-10 to take policy, strategic and tactical decisions about implementation of the programme had met only six times. Inadequate Board oversight had also contributed to poor execution of the project.

The reply of LAWDA that the meetings could not be held due to busy schedule and pre-occupation was not acceptable as lack of monitoring of the project had contributed to its remaining incomplete in respect of most of its components. The likelihood that all components would be complete by the end of the year 2012 seemed remote.

1.3.14 Internal Controls

Proper internal control mechanism in an organization is essential for smooth implementation of various programmes undertaken by it. Existence or otherwise thereof adversely affects the day to day activities of the organization. The review of the organization of Authority showed inadequacies in controls as brought out hereunder.

- Despite M/S Thermax having defaulted by not executing the work on the three STPs to the specifications of the conservation programme, it was allotted (August 2009) the work of the remaining two STPs under the programme with a different technology (SBR) at an aggregate cost of ₹34.64 crore. It was seen that although M/S Thermax had originally offered its rates for 'Moving Bed Bio Reactor (MBBR)' technology, yet the State Contract Committee negotiated the rates with the firm for 'Sequencing Batch Reactor (SBR)' technology after opening of the financial bids of three firms instead of negotiating the rates with the firm (ION Exchange) which had offered the rates for SBR technology. It was also seen that the Authority had opened financial bids prior to technical evaluation of each tenderer which contravened the basic tenets of tendering. On this being pointed out, the Financial Advisor and Chief Accounts Officer (FA & CAO) of the Authority stated that M/S ION Exchange had been requested vide a series of letters to match the price offer with that of the lowest tenderer M/S Thermax (who had offered for MBBR technology). The reply was not acceptable as the former had requested for negotiating the rates but the authority had not responded to its pleadings. It was further seen that the firm had been paid interest-free

mobilization advance (₹3.35 crore) and material (₹2.26 crore ended December 2010) on credit basis though the terms did not contain such provisions, thereby extending undue favour to the firm. On this being pointed out, the FA & CAO stated that no interest is to be levied on mobilization advance under the State Public Works Accounts Code. The reply was not tenable as provision for payment of such advance to contractors does not exist in the State Public Works Accounts Code. However, the payment of such advance has been defined in the Central Public Works Accounts Code which envisages levy of interest on such advances. As regards issue of material on credit basis, it was stated that the practice would be stopped in future. Issue of material on credit basis so far was not, however, explained.

- Submission of monthly progress reports: Progress reports regarding implementation of the project were required to be submitted to the GOI and the State Government on quarterly basis. Delays of up to 38 days were, however, observed in submission of progress reports to MoEF/State Government. Besides, nine monthly progress reports were not sent to MoEF and State Government respectively. Progress reports prior to April 2007 had either not been sent to the GOI/State or the same had not been prepared.
- Allotment of works without invitation of tenders: Allotment of works for execution without ascertaining the reasonability of rates is prohibited under the State Financial rules. The Authority without resorting to proper tendering process as required under rules had allotted works amounting to ₹1.01 crore to contractors in violation of rules.
- Diversion of funds: Despite the fact that the GOI had categorically laid down in the sanction order that the cost of operation and maintenance (O&M) should be borne by the State Government, the Authority had spent ₹4.84 crore on this component leading to diversion of programme funds. The reasons for the violation, though called for were not assigned.
- Adjustment of advances: An amount of ₹37.41 crore had been advanced to various agencies/departments during 2005-11 for procurement of material/execution of various works. The advances were debited to the final head of account without obtaining adjustment account therefor. This had resulted in inflation of expenditure and consequently understatement of balances. In reply it was stated by the EE that action would be taken after reconciling the figures.
- Unclaimed deposits: Deposits which remain unclaimed for over three years are required to be transferred to Misc. Revenue as per the State Public Works Accounts Code. Notwithstanding this LAWDA continued to hold the deposits of CDRs/bills of ₹ 0.54 crore (Test-checked cases) in its accounts without actually transferring them to the revenue of LAWDA. The VC stated that action as warranted under rules would be taken.
- Undue financial aid: Despite incorporation of a specific condition in the NIT regarding issuance of material to the contractors on cash-basis, the Authority continued to issue key construction material to the contractors on credit-basis which was tantamount to undue financial aid to contractors. The amount of such undue financial aid involved in the test-checked cases alone stood at ₹2.80 crore. The EE stated that the material was being issued departmentally for maintaining the quality control. The reply, however, did not contain the reasons for issuance of the material on credit-basis.
- Obtaining of sales tax/VAT clearance certificate: The conditions incorporated in the supply orders stipulate production of sales tax/VAT clearance certificates of the Sales Tax Department

from the suppliers before making payment for the supplies made. Authority had in contravention of the same paid ₹ 4.12 crore to the suppliers without the requisite certificates. The EE stated that instructions had been noted for compliance.

- **Non-finalization of accounts:** In terms of Section 21 of the Jammu and Kashmir Development Act, 1970, LAWDA is required to prepare annual accounts in consultation with auditor to be appointed by the Government. LAWDA, despite having a full-fledged Accounts Wing had neither prepared its accounts nor engaged Chartered Accountants to prepare the annual accounts. LAWDA had not even prepared the accounting manual nor prescribed the accounting procedures to be adopted by it. In the absence thereof, the financial position and details of assets/liabilities of Authority could not be ascertained. Non-preparation of accounts had exposed the organization to the risk of financial irregularities/frauds going undetected. The VC stated that a Chartered Accountant had been engaged for preparation of Annual Accounts.

- **Excess payment:** The amount of ₹ 11.05 crore paid to M/S Thermax for construction of STPs (paragraph 1.3.9.2) included an excess payment of ₹ 30.83 lakh. On being pointed out, the EE stated that the payments had been made by the Head Office. The reply of the division was not acceptable as the payments had been made by the Head Office after due verification of the contractors bills by the EE.

1.3.15 Effectiveness of the programme

A comparative position of indicators defining the health of the lake at various points of time, before embarking upon the conservation programme and during 2010-11, is tabulated hereunder.

Table 1.3.3

Year	1996-97	2005-06	2010-11	Variation during review period
PhValue	NA	8.0	7.9	(-) 0.1
Dissolved Oxygen	8.6	6.1	6.2	(+) 0.1
Nitrate Nitrogen	272	572	418	(-) 154
Ammonical Nitrogen	362	319	126	(-)193
Ortho-phosphate	135	105	178	(+) 73
Total Phosphorous	768	360	485	(+) 125
Chemical Oxygen Demand (COD)	NA	25	32	(+) 7
Biological Oxygen Demand (BOD)	NA	NA	13	-

Increases in the parameters defined in the table and reduction in dissolved oxygen content is detrimental to the health of the lake. As can be seen from the table, though Nitrogen Nitrate and Ammonical Nitrogen components have come down, the other components have increased to the detriment of the quality of water leading to excessive vegetation. The drastic change in the water quality was attributed to intensified release of nutrients due to soil erosion, run-off from catchment area and discharge of urban wastes including inorganic fertilizers. The increase in the value of total dissolved solids indicated continued siltation, failure of retention of silt by settling basin and high ingress of sewage into the lake and mineralization process of organic

matter. This indicated that multi-pronged approach to conserve and manage the lake had been neither effectively implemented nor properly monitored for the desired outcomes.

1.3.16 Wular Lake Conservation Programme

The Wular Lake Conservation Programme had been recently included in the NLCP. A Conservation and Management Programme for the lake had been prepared (Forest Department) and submitted (2007) to the MoEF at an estimated cost of ₹386.39 crore against which the 13th Finance Commission had recommended ₹ 120 crore for the current five year plan with year-wise allocation of ₹ 30 crore starting from the year 2011-12. The State had not established any authority as yet for implementation of the programme.

1.3.17 Conclusion

The State Government had not conducted any survey of lakes for source water protection. No nodal agency was formulated for the overall formulation, implementation and co-ordination of the comprehensive programme for pollution control in lakes. DPR for conservation of Dal Lake had not been prepared after exhaustive study and had been accepted without proper evaluation. Sub-optimal performance of the STPs, partial working of settling basin, non-completion of house-to-house connectivity for carriage of sewer, non-construction of gates, etc. for the bays had resulted in increase in the nutrients and weeds and depletion of the fish population in the lake. No studies had been carried out to ascertain whether the springs existing in the lake were actually carrying water to lake or had choked. No adequate planning existed for re-settling Dal-dwellers despite spending huge amount on this count.

1.3.18 Recommendations

- The State Government needs to appoint a nodal agency to coordinate planning and implementation of the programmes for all the water bodies in the State.
- LAWDA needs to have a well-functioning and adequately empowered PMC, State Level Monitoring Committee, Scientific Advisory Committee and Board.
- LAWDA needs to have a well-documented accounting system in place for efficient financial management of the programme to prevent occurrence of any frauds.
- House-to-house connectivity and houseboat sanitation needs to be given priority so that the wastes from the areas outside and inside the lake do not enter the lake.
- Dredging of the blocked channels, de-weeding, creation of reed belt, development of shoreline, establishment of aerators and carrying of fresh water from streams to the lake need to be done on scientific lines for stopping degradation of the lake.
- Rehabilitation and resettlement programme of the lake-dwellers needs to be given top most priority.
- With a view to making the Authority a self-sustaining organization as per the provisions of the DPR, all the activities undertaken in and around the lake needs to be transferred to LAWDA.