

## Chapter 4: Implementation of programmes for control of pollution of rivers, lakes and ground water

### 4.1 Programmes for control of pollution of rivers, lakes and ground water

#### 4.1.1 At the Centre

With respect to programmes for source protection, treatment and restoration of rivers, we observed the following:

**In the case of rivers** Ministry of Environment and Forests (MoEF), Government of India launched Ganga Action Plan (GAP) Phase-I in 1985 to address the issue of pollution of river Ganga. Subsequently, the programme was extended to other rivers and all the projects were included in National River Conservation Plan (NRCP) in December 1996 and the programme is ongoing.

**Table 5: Activities covered under National River Conservation Plan**

<b>Interception and Diversion works</b>	•to capture the raw sewage flowing into the river through open drains and divert them for treatment
<b>Sewage Treatment plants</b>	•for treating the diverted sewage
<b>Low Cost Sanitation works</b>	•to prevent open defecation on riverbanks
<b>Electric Crematoria</b>	•to conserve the use of wood and help in ensuring proper cremation of bodies brought to the burning ghats
<b>River Front Development Works</b>	•improvement of bathing ghats
<b>Public awareness</b>	•through media and other outreach programmes
<b>Human Resources Development</b>	•capacity building, training and research in the area of river conservation

For **lakes**, MoEF has implemented the National Lake Conservation Plan (NLCP) since June 2001 for conservation and management of polluted and degraded lakes in urban and semi-urban areas of the country where degradation was primarily on account of discharge of waste water into lakes.

Table 6: Activities covered under National Lake Conservation Plan

Prevention of pollution from point sources	•sewerage and sewage treatment for the entire lake's catchment area
In-situ measures of lake cleaning	•desilting, dewatering, bio remediation- aeration, bio-manipulation, nutrient reduction, constructed wetland approach
Catchment area treatment	•afforestation, storm water drainage, silt traps etc.
Lake front eco-development	•strengthening of bund, lake fencing, shoreline development etc.
Public awareness	•outreach programmes with citizens of different age groups
Human Resources Development	•capacity building, training and research in the area of lake conservation

Agriculture is widely practiced in our major river basins and runoff from agriculture like fertilizer runoff, chemical pesticides runoff seep into the ground water or flow untreated into rivers/lakes. This has contributed significantly to infusion of nitrogen into our rivers/lakes and choking them with weeds and causing eutrophication.

No programmes have been introduced for tackling agricultural non-point source pollution of rivers and lakes by measures like promoting the use of organic manure, banning use of synthetic pesticides and fertilizers, integrated pest management.

#### For the mitigation of pollution of ground water, we observed the following:

According to MoEF, the Non-point source from agricultural practices does not come under the purview of MoEF. Awareness programmes of MoEF are projecting the issues of pollution from agriculture sector and the same would have to be dealt by Ministry of Agriculture. Programmes for source water protection of **groundwater** and for tackling agricultural non-point source pollution of **groundwater** have been introduced by MoEF.

The Ministry of Water Resources has implemented a scheme for repair, renovation and restoration of water bodies with domestic as well as external assistance. This scheme launched in 2005, has been sanctioned in respect of 1098 water bodies in 26 districts of 15 States. Its goals are to improve select tank systems and their catchment areas, recharge the water bodies, and increase water use efficiency. This scheme, however, has a more quantitative than qualitative focus.

#### 4.1.2 In the States

Audit scrutiny on this issue revealed:

- Only Tamil Nadu had framed programmes for source water protection of rivers and lakes;

- Programmes have been framed for pollution prevention of rivers by only five States: Andhra Pradesh, Assam, Delhi, Haryana and Kerala;
- Only Kerala and Tamil Nadu had designed programmes for pollution prevention of lakes;
- Only Andhra Pradesh, Goa, Kerala and Sikkim had framed programmes for tackling agricultural non-point source pollution of rivers;
- Only Goa, Sikkim and Kerala had framed programmes for tackling agricultural non-point source pollution of lakes; and
- Only Andhra Pradesh, Goa and Kerala had framed programmes for tackling non-point source pollution of ground water.

MoEF stated in June 2011 that pollution from industrial sources was required to be tackled through enforcement of pollution control laws by the State Pollution Control Boards by means of obtaining consent to establish and operate from the concerned Pollution Control Board.

It also stated that action was to be initiated against the defaulters by the concerned SPCB under the provisions of the Water Act 1974 and EPA Act 1986. However the fact remains that these were not included under NRCP and various reports of CPCB illustrate the fact that these standards were not strictly enforced and industrial effluents continued to pollute river and lake water.

#### **4.1.3 Criteria laid down by NRCD for selecting a river/lake for Conservation:**

A lake/river may be selected for conservation under the NRCP/NLCP if

- The water body-river, lake or the sea is so degraded that it cannot be put to its traditional and desired use.
- The people are strongly aware of the degradation.
- They highly value the restoration of the water body.
- lakes smaller than 10 hectares and less than three metres depth or temporary/seasonal lakes which dry up every year should not be covered.

#### **4.1.4 Criteria for selecting towns for taking up Conservation of rivers and lakes**

Works may be proposed in a town if :

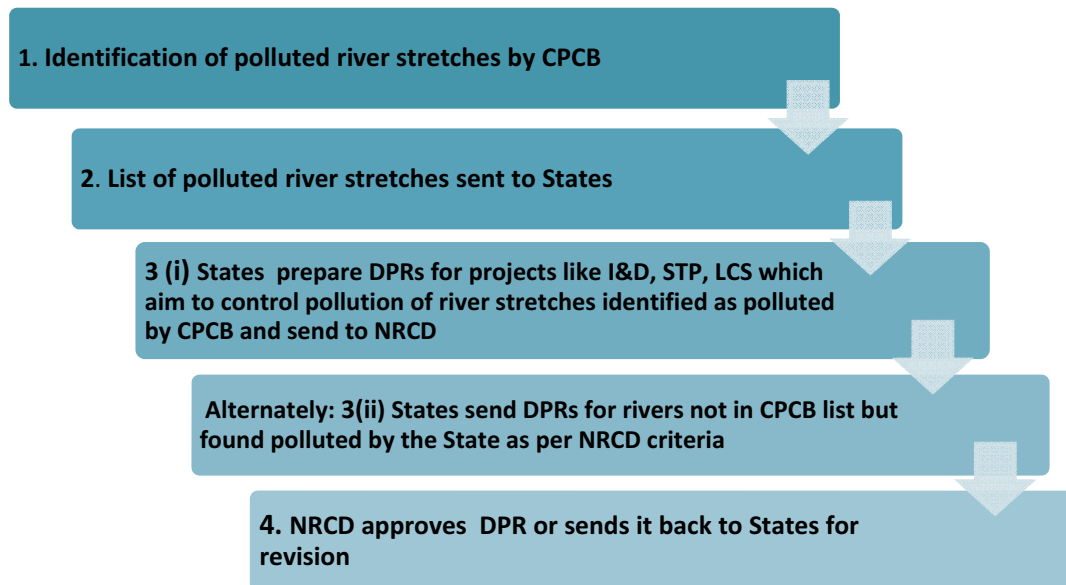
- The town is located on the bank of river or lake or is a coastal town.
- The population of the town is at least one lakh.
- The water body (river/lake) is highly degraded and cannot be put to its traditional/designated use because of:
  - Discharge of domestic waste water/industrial waste
  - municipal solid waste
  - other non-point sources of pollution

- The flood plain is heavily encroached.
- Wrong land use in violation of the Master Plan leading to heavy soil erosion and sediment transport to the water body.
- There is high level of awareness about the city being the major cause of degradation of the water body leading to the demand from the residents of the town to take up conservation measures.
- The citizens are willing to demonstrably raise additional resources and make financial contribution of a minimum of 10% of the project cost and to meet the recurring expenses of O& M and other heads.
- The local body is willing to make its contribution and take responsibility for preparing and implementing the project and carrying out O&M at its own cost.
- The residents of the town, the local body and the State Government together are willing to contribute a minimum of 30% of the project cost, out of which the citizens are willing to contribute a minimum of 10% of the project cost

## 4.2 The process of inclusion of rivers under NRCP

The process of inclusion of rivers into NRCP is shown in the graph below:

**Table 7: inclusion of rivers into NRCP**



**Audit findings:****4.2.1 Selection of rivers****At the Centre****Assessment of pollution of rivers from different sources not comprehensive**

There was no comprehensive assessment of the pollution levels of all the rivers in India from the different sources before MoEF initiated NRCP. The pollution load discharged by cities and towns in Ganga river basin was worked out in 1984. In 1988-89, CPCB identified 10 polluted river stretches to concentrate the pollution control efforts. The study of polluted river stretches formed the basis for formulation of River Action Plan. CPCB identified 39 polluted river stretches during the year 1992 and subsequently increased to 139 polluted river stretches in 2006 and to 150 polluted river stretches in 2008. The pollution load generated by Class I Cities and Class II towns, river basin-wise, was first worked out and published in the document in the year 2003.

CPCB has laid down the liquid effluent discharge standards for 42 industries. These include battery manufacturing, dairy, fertilisers, hotels, oil drilling and refining tanneries and thermal plants. However, it had not quantified the effluent load in all the rivers by each source. That is to say, it did not take into account small, medium and large industries, distilleries, mines, oil refineries, tanneries, paper and pulp industries, sugar factories, agriculture runoff, pesticides and insecticides sprayed on crops as potential causes of pollution.

In June 2011, MoEF affirmed Audit's conclusions stating that the projects for abatement of pollution on rivers had been selected by NRCD on the basis of quality of water. The project proposals submitted by the State Governments contained information on details of waste water generated in the town/city, the extent of treatment capacity available and details of industrial pollution. Further, MoEF stated that detailed guidelines for the preparation of DPRs under NRCP hitherto followed have now been revised.

Further, NRCP focussed on sewage and crematoria as the sources of pollution of rivers. Other kinds of pollution (like industrial pollution) were not considered which had an equal, if not more, adverse effect on health and environment.

**Although CPCB has created a list of the sources of pollution, MoEF has not created programmes to prevent effluents entering the rivers. NRCD projects deal only with stretches where pollution has already occurred.**

**In the States**

- Only Bihar, Goa, Odisha and Punjab had conducted a survey to quantify pollution caused by sewage to all the rivers by all the towns/cities situated on banks of rivers flowing in the State.
- Only Odisha and Punjab had made some attempts to quantify pollution caused by industries and agriculture runoff flowing into its rivers.

- Only eight States, Bihar, Delhi, Haryana, Kerala, Odisha, Rajasthan, Tamil Nadu and Uttarakhand, had sent a list of polluted rivers in the State, based on assessment of amount of pollution, to MoEF for inclusion under NRCP.
- Of the 20 States in which rivers have been included in NRCP, the State governments in only eight States, viz., Bihar, Goa, Maharashtra, Odisha, Rajasthan, Sikkim, Tamil Nadu and Uttarakhand planned to address the complete reduction of pollution of the river.

In June 2011, MoEF stated that the collection of sewage and providing adequate infrastructure for its treatment and disposal was the responsibility of the State Governments. It further stated that MoEF was not mandated to carry out projects for providing sewerage facilities in the States and MoEF was only supplementing efforts of State Governments by providing financial assistance.

It also stated that with the modest resources allocated for the programme, only certain rivers and certain cities could be taken up for implementing pollution abatement programmes which was dependant on the proposals received from the State Government with their willingness to provide the required 30 per cent share of project cost and commitment for operation and maintenance of created assets. MoEF also stated that it was primarily the responsibility of the industry concerned to adhere to the effluent standards prescribed, which was being monitored by the State Pollution Control Boards under the provisions of the Water (prevention and control of pollution) Act 1974.

MoEF's reply fails to address the concerns raised by audit regarding the planning of pollution control programmes. While it is an undisputed fact that the responsibility for creating infrastructure for collection, treatment and disposal of sewage rests with the States, as per Section 16(2) (f) of the Water (Prevention and Control of Pollution) Act, 1974, it is the responsibility of CPCB to collect, compile and publish data relating to water pollution and devise measures for its effective prevention and control.

Further, there is no comprehensive database on the pollution load entering water bodies across the country. Also, data on sewage generation published by CPCB in December 2009 pertains only to Class I and II towns while the rural hinterland remains unrepresented. Similarly, the data on Common Effluent Treatment Plant ( CETP) pertains to 78 CETPs in this country relating to the period 2002-2005. The reply is silent on these issues of identification of towns and cities which were most responsible for polluting the rivers flowing through and MoEF has shifted the onus of responsibility for such identification onto SPCB. It is agreed that industry-specific effluent standards and action plans have been devised by CPCB, however, there is no indication that such data has been used to plan the programme for reduction of pollution of rivers.

#### **4.2.2 Inclusion of rivers under NRCP not based on their pollution levels**

As mentioned in para 4.1.3 and 4.1.4, priority is to be accorded to those stretches of a river which has been identified by CPCB as being most polluted. The projects are formulated on City Sanitation Plan. The emphasis is on the entire town, rather than the entire river, even though a token nod is made for the need to adopt a holistic approach. Since projects are being selected in a fragmented manner and not primarily for reduction of pollution of the entire river, the efforts to clean up the river are bound to only yield fractional results.

- Audit scrutiny showed that rivers in States like Assam, Himachal Pradesh, Manipur, Tripura, Chhattisgarh, Meghalaya and Puducherry figured in the list of polluted river stretches but no river was selected for inclusion under NRCP.
- Similarly, in the case of Goa, river Mandovi was not identified as most polluted stretch but was included in NRCP.
- It was also observed that in Kerala, the most polluted stretches were along rivers Karamana, Puzhackal and Kadambayar but Pamba, which did not figure in this list, was selected under NRCP.
- Similarly in Uttarakhand, most polluted stretches were along river Kosi, Dhela and Kichha and Bahalla but Ganga, which does not figure in this list was selected.
- Two rivers namely, Mandovi and Beehar did not figure in any survey of polluted stretches and the lists of polluted rivers produced by CPCB over the years.

**Audit observed instances where polluted rivers were not selected under NRCP and others, which were less polluted, were selected for pollution control.**

CPCB stated that the polluted stretches were identified based on the network of 980 monitoring stations on rivers. It also stated that since all the streams in the country were not monitored, it was not possible to conclude that all the polluted stretches of rivers in the country were identified. The reply reveals that rivers were to be included under NRCP only if they figured in the list of most polluted rivers and illustrates the fact that CPCB surveys were not comprehensive.

In June 2011, MoEF stated that water bodies not meeting the desired water quality criteria had been identified as polluted. While 10 river stretches not meeting the desired criteria were identified during 1988-89, 37 were identified in 1992 and 150 were identified in 2008. Towns and cities were included under NRCP for abatement of pollution of rivers on the basis of proposal received from the State Governments and approved under NRCP on the basis of funds available under the Plan from time to time.

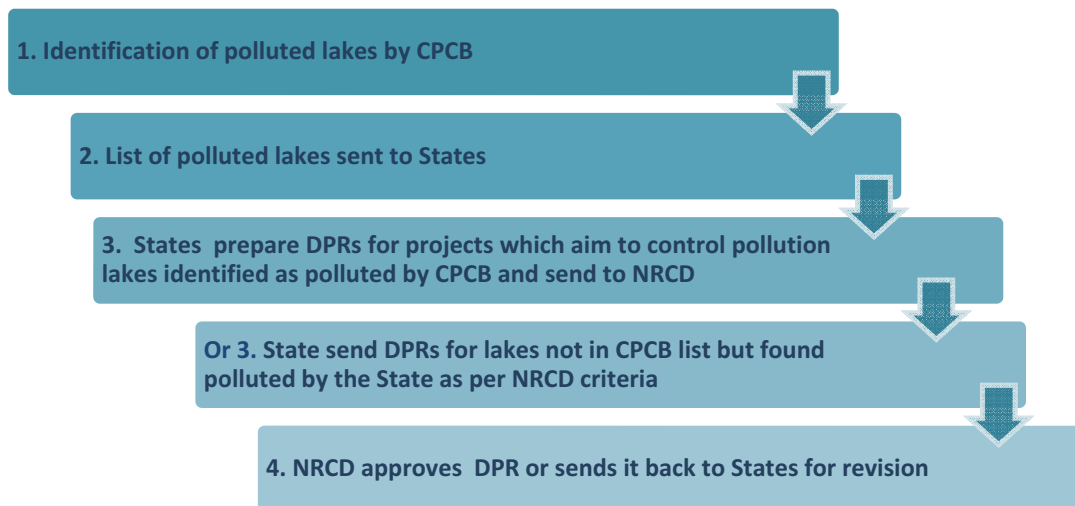
The reply of MoEF needs to be viewed in light of the fact that given that CPCB data is accessible, or indeed, under the control of MoEF, this data was not utilised to point out the discrepancies to State governments while scrutinising their proposals. This is an indicator of the fact that mere preparation of database is not a sufficient condition for the efficient implementation of a programme. Audit found no evidence to show that the said data was being co-related to the DPRs being forwarded by States.

**The State-wise selection of rivers in NRCP was asymmetrical. For example, 69 projects for Madhya Pradesh and 83 for Tamil Nadu were approved under NRCP. By comparison, only 69 were approved for Maharashtra, Gujarat and Andhra Pradesh put together, despite the fact that the latter group had more number of polluted rivers.**

### 4.3 The process of inclusion of lakes under NLCP

The process of inclusion of lakes under NLCP is shown in the chart below:

**Table 8: inclusion of lakes into NLCP**



#### 4.3.1 At the Centre

Prior to introduction of NLCP, a National Committee set up by MoEF in 1993, identified 21 highly degraded urban lakes for conservation and management. Later in 1994, the lakes were prioritized and 10 polluted & degraded urban lakes having some tourism potential were proposed for conservation.

##### 4.3.1.1 Quantification of pollution of all the lakes not done

Quantification of pollution of all the lakes in terms of sewage, small/medium/large industries, distilleries, mines, tanneries, paper and pulp industries, sugar factories, agricultural runoff, pesticides/insecticides was not done by MoEF/CPCB. In the absence of this information, MoEF would not be able to target the reduction of pollution being caused by these sources.

##### 4.3.1.2 Inclusion of lakes under NLCP which were not included in the priority list

In order to identify polluted and degraded lakes across the country, a study was carried out at the instance of Planning Commission. A list of 62 lakes requiring conservation was prepared under the study. In November 2002, MoEF asked all State Governments to send priorities for lakes in their States for consideration under NLCP. This prioritisation was to be done on the basis of hydrological data (relating to the quantity of water), scientific criteria (based on CPCB's "Designated Best Use" norms) and Administrative criteria (based on heavy public demand and if stakeholders promised to bear 10% of the costs out of the State's share).

The response of the States was limited so, in June 2004, in order to develop objectivity in the selection of lakes for conservation and to consider the priorities of the State governments, MoEF again requested States to take up the exercise of prioritizing the lakes in their States.

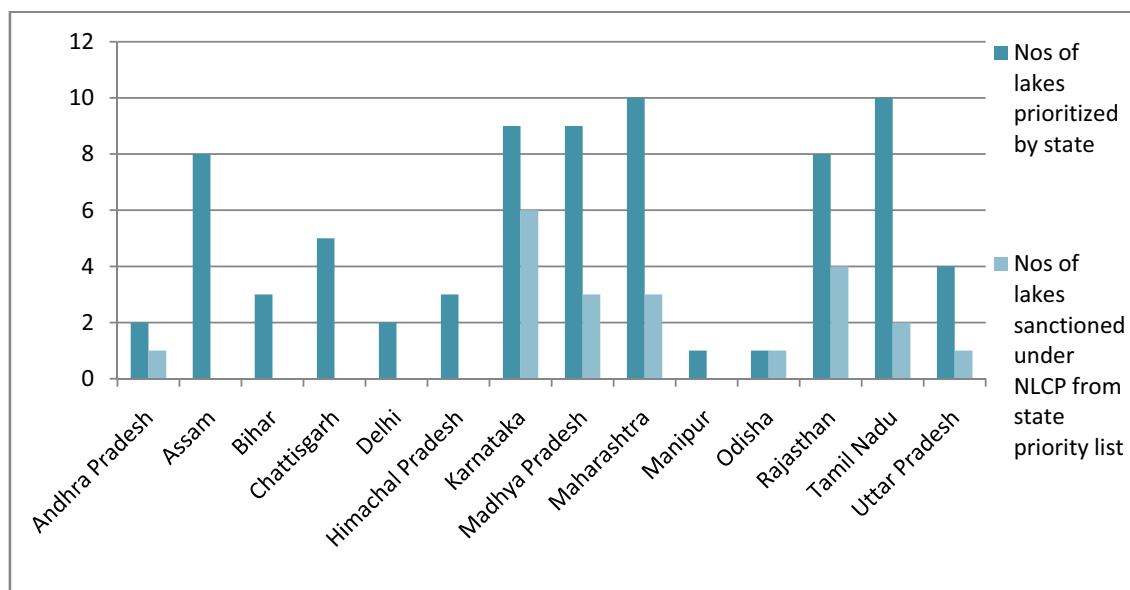


The consolidated priority list furnished by MoEF to audit in respect of all the States/UTs revealed that only 12 States/UTs had prioritized their lakes which indicated the low priority attached by the States to this vital activity.

Further, 12 projects covering 23 lakes were included under NLCP even though these did not figure in the priority list of lakes prepared by the States concerned.

Scrutiny also showed that although seven States<sup>9</sup> had sent MoEF a priority list of lakes to be included under NLCP, MoEF sanctioned no funds to these States. It was also observed that out of 28 States and seven Union territories in India, NRC had funded projects in only 14 States. Out of 58 lakes, 16 lakes were funded in Karnataka, 14 in Maharashtra and five each in Uttarakhand and Rajasthan.

**Chart showing number of lakes prioritized by state and out of those number of lakes sanctioned under NLCP**



#### 4.3.2 In the States

- Seven States, namely, Chhattisgarh, Himachal Pradesh, Bihar, Delhi, Andaman and Nicobar, Manipur and Assam had furnished priority list but no lake was funded in these seven States.
- Six States namely Jammu and Kashmir, Kerala, Uttaranchal, West Bengal, Tripura and Nagaland had not furnished their priority list of lakes but NRC had funded eight projects covering 15 lakes in these States and
- 12 projects covering 23 lakes were funded even though these were not included in the priority list of lakes furnished by the respective States.

In June 2011, MoEF stated that in order to identify polluted and degraded lakes across the country and at the instance of Planning Commission, a study was carried out by it in November 2003 as a result of which, a list of 62 lakes across the country requiring

<sup>9</sup> Chhattisgarh, Himachal Pradesh, Bihar, Delhi, Andaman and Nicobar, Manipur and Assam

conservation was prepared. State Governments were asked to review this list and to prioritize the lakes in their States for submission of proposals under NLCP. MoEF further stated that while States like Chhattisgarh, Himachal Pradesh, Bihar, Manipur, Assam etc, furnished priority lists but either did not submit any proposal for consideration under NLCP, or the same were not found meeting NLCP guidelines, other States sent their proposals, which were examined by MoEF and approved for funding under NLCP.

The reply needs to be viewed in light of the fact that selection of lakes was not based on objective pollution-related criteria. MoEF, while confirming the position outlined by audit, is silent on the specific reasons as to why certain proposals were approved/not approved. The fact remains that there was no quantification of pollution load of each lake by way of sewage, industrial effluents or agricultural runoff and as a result, it is likely that some lakes which were more polluted than the ones selected for abatement, were not included under NLCP. As the nodal agency for pollution prevention in India, MoEF should have played a more proactive role in selection of polluted lakes, based on pollution-related criteria, under NLCP.

#### 4.4 Performance of projects undertaken under NRCP

##### 4.4.1 No technical evaluation of DPRs

The DPRs were appraised in-house by MoEF and were not sent to a specialist task force/panel of scientists from reputed institute for evaluation. As a result, expert feedback was not available while sanctioning projects under NRCP. From the evidence made available to Audit, it is not clear how MoEF ensured that the DPRs were complete, that they addressed the right concerns and would ensure effective and efficient implementation. MoEF had not fixed any time limit for preparation and submission of DPRs by the States to MoEF and for approval of DPRs by MoEF.

In June 2011, MoEF endorsed the audit findings and stated that the project proposals submitted by State Governments were being examined by the NRCD scientists till recently. MoEF also stated that presently projects are being appraised by independent appraisal institutions after which these are taken for approval before the competent authorities.

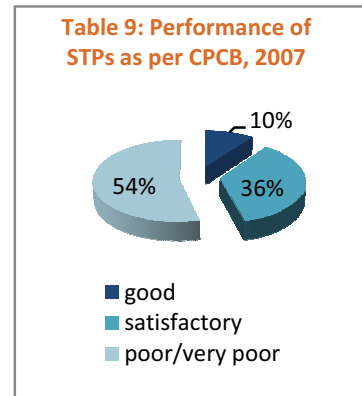
While it is recognised that MoEF now has the DPRs vetted by technical experts, the fact remains that DPRs sent to it since the 1980s have been scrutinised by MoEF in-house. To that extent, the assessment of the DPRs and the plan of implementation contained in the DPRs may not have been a process informed by technical know-how and therefore, could end up contributing to less than optimal outcome.

##### Some details to be contained in DPRs:

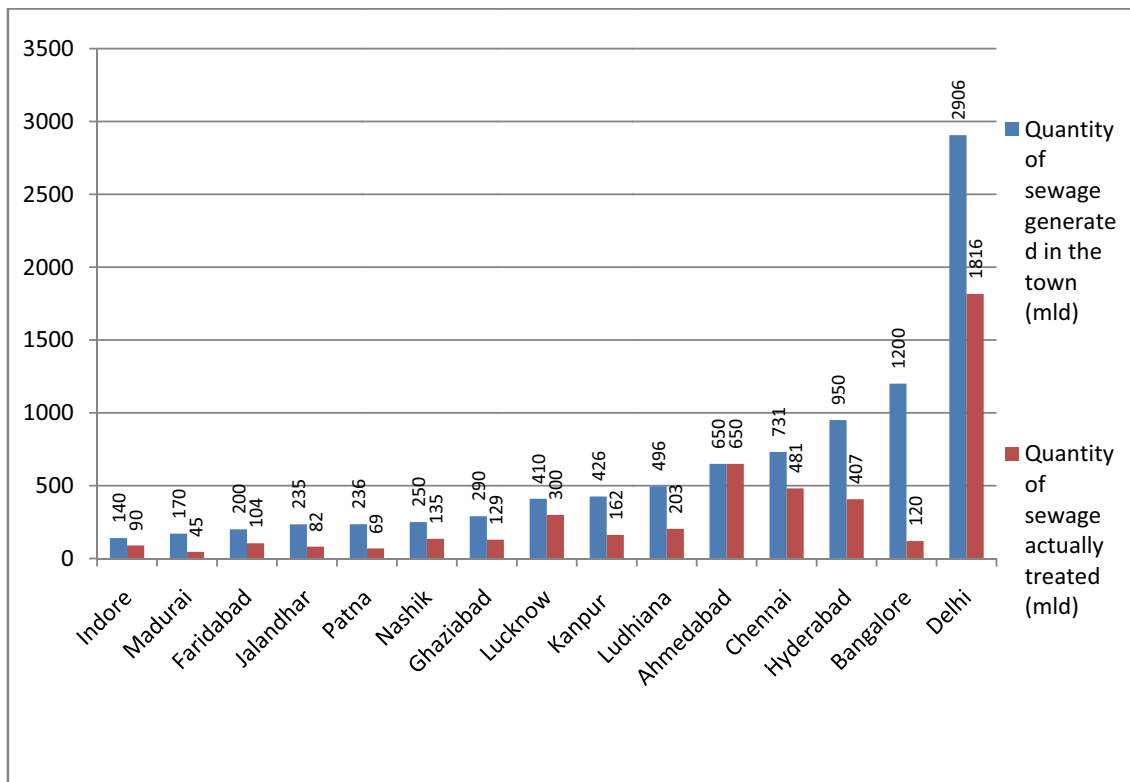
- Review of the status of the river/lake system.
- Identification of degraded stretches & towns responsible for it.
- Selection of Towns in order of priority where conservation works should be taken up and the justification for their selection.
- Information about the river/lake and basin/catchment useful for system and component design.
- Investigation carried out for DPR Preparation.
- Design of system and components.
- Human, physical and financial resources required for Operation & Maintenance and the manner in which they will be ensured.
- Plan for Public Awareness & Public participation.
- Monitoring & Evaluation plan.
- Cost Estimates with drawings and specifications.

#### 4.4.2 Inadequacies in performance of sewage treatment plants

As already discussed, the treatment of sewage has been the primary focus of projects selected under NRCD. CPCB had evaluated the performance of 84 of the 175 STPs built under NRCP in 2007. According to this evaluation, the performance of 46 STPs was poor or very poor, eight were rated good, while the performance of the balance 30 was satisfactory. The CPCB Report pointed out that capacity utilisation was inadequate. It also stated that sludge removal was the most neglected area with most of the sludge handling facilities being out of order. The Report observed that the task of operating the STPs was given to contractors who were deputing unqualified staff for the task, which was a factor in the poor performance of the STPs. As a result the gap between total generation of sewage and what is actually treated is extremely wide. The chart below brings out the position.



**Chart showing town-wise quantity of sewage generated (mld) and quantity of sewage actually treated (mld)**



As is evident, even the National Capital was treating 62 per cent of sewage generated; Bangalore only a miniscule 10 per cent and Hyderabad 43 per cent. Among the large cities, checked in audit, only the city of Ahmedabad had the capacity to fully treat sewage generated.

Thus, STPs which were the mainstay of NRCP, were not achieving the objectives set out for them.

In June 2011, MoEF endorsed the audit findings and stated that due to a variety of unforeseen reasons, full utilisation of installed capacity is not possible. It further stated that one of the reasons for under-utilisation of capacity was inadequate collection of sewage from city due to incomplete network of sewers. MoEF's reply highlights the urgent need for holistic view of sewage treatment which requires not just construction of STP, but also assessment of sewer drains, efficiency of sewage collection, removal of sludge around STP and the need for uninterrupted power supply to them.

#### 4.4.3 In the States

Audit test checked 140 projects across 19 States and 41 towns situated on banks of 24 rivers for detailed scrutiny. Results of audit scrutiny of implementation of these projects are discussed below:

- Out of 140 projects test checked, 75 per cent (105 projects) were completed. 30 remained incomplete, work was stopped in two projects, two projects were abandoned and no information was available to verify the status of one project.
- Out of 105 completed projects, 86 projects were completed after the scheduled date of completion. The extent of delay in completion is given in the table below:

Extent of delay	Number of projects
Between 1 month and 1 year	26
More than 1 year to upto 2 years	11
More than 2 years to upto 3 years	6
More than 3 years to upto 5 years	26
5 years and above	17

- Out of 94 completed projects pertaining to STP, I&D, MPS, LCS, SWM, Sewer Line, Crematoria, Disinfection Plant etc, 50 projects were able to perform as envisaged, in 14 projects, performance was hampered due to infrastructural problems and for remaining 30 projects, information was not available to verify the status.
- Of the completed projects, 28 projects costing ₹251.27 crore were constructed but not utilised as yet. The list of projects constructed but not utilised is attached as **Annexure 2**.
- Out of the 105 completed projects, only in 14 projects, the State governments had assessed whether installed capacity was fully utilised. For 62 projects, this information was not available and for remaining 53 projects, the State governments had not assessed whether installed capacity was fully utilised.
- Of the 47 STPs test checked, 37 STPs were completed. Out of 37 completed projects, targets for effluents treatment were met in 13 STPs and in seven projects, targets were met partially. Two projects were shut down due to infrastructural problems and for remaining 15 projects, information was not available to verify the status.

Detailed Audit findings with regard to implementation of NRCP projects of 19 States are discussed below

### Andhra Pradesh

Audit test checked six projects for cleaning up Godavari and Musi rivers in Rajamundry, Ramagundam and Hyderabad. We found that none of the projects test checked had met their intended objectives of pollution control.

- In Ramagundam town, two STPs were not working according to installed capacity. The interception and diversion project was not serving its purpose as pumps were found missing and the pump house was not put to use.
- In Rajahmundry town, one test checked project was completed after a delay of more than 5 years.
- In Hyderabad, one test checked completed project, levels of Faecal Coliform had increased in Musi after leaving Hyderabad.

### Bihar

We test checked six projects in the cities of Barahaya and Patna sanctioned for control of pollution of Ganga river. None of these projects met their objectives of controlling pollution entering the Ganga.

- Two of the projects, viz., construction of diesel crematoria at Danapur and River Front Development of GulbiGhat, Patna remained incomplete.
- In Patna, ghats constructed in 2003 were either defunct or not being maintained.
- Another River Front Development at Danapur was also in a deplorable condition and was not being used.
- The project for River Front Development at Barahaya completed in July 2002 was not found to be existing as the course of Ganga has shifted from the proposed sites. Both the ghats were completely destroyed due to erosion.

### Delhi

In Delhi, 10 projects which aimed to control pollution in river Yamuna were test checked.

- Capacity of the test checked STP at Sen Nursing home was 10 mld whereas the total sewage generated was around 60-70 mld; the rest of 50-60 mld untreated sewage was being discharged into the Yamuna river.
- In respect of test checked STP at Delhi Gate Nala, capacity of created STP was 10 mld whereas total sewage generated was around 40-50 mld. Remaining 30-40 mld untreated sewage was falling into the Yamuna river.
- Two other STPs were designed to treat 3 mld of sewage each, but each of them was treating 1 mld of sewage, the rest being discharged into the Yamuna.
- Another STP of 2 mld was constructed but the plant had been shut down since 2007 and all the sewage (2 mld) was being discharged into river Yamuna through drain/nallah without treating.
- Another STP was still not complete.
- Low Cost Sanitation project completed in 2003, envisaged construction of 1146 units but only 959 units were built, out of which only 471 were functioning.

## Goa

In Goa, out of five sanctioned projects for control of pollution of Mandovi river in Panaji town, four were test checked by Audit.

- Two projects were completed and were functioning as envisaged.
- No information was available regarding completion date of the remaining 2 projects.

## Gujarat

In Gujarat, out of 13 projects selected for control of pollution of Sabarmati in Ahmedabad, nine projects were test checked by Audit.

- All the test checked projects were completed and were working as envisaged. The capacity of the STP is higher than the quantity of sewage generated. Currently, no sewage flows into the Sabarmati from the city.

## Haryana

In Haryana, Audit selected 10 projects in the cities of Faridabad and Panipat for detailed scrutiny.

- Seven test checked projects were completed after delay of up to a year.
- In Faridabad city, STP was constructed to treat 20 mld of sewage but was treating only 14 mld and the rest 6 mld was flowing into the Yamuna.
- In Panipat, no information was available regarding the utilisation of the test checked projects.

## Jharkhand

Four projects which aimed to control pollution of river Subarnarekha in Jamshedpur and Ranchi cities were test checked in audit.

- In Ranchi, one test checked project has not yet been completed.
- In Jamshedpur, the projects involving construction of low-cost sanitation and river front development projects were still incomplete.

## Karnataka

Audit test checked three projects for control of pollution of Bhadra, Tungabhadra and Pennar rivers in the cities of Bhadravati, Devanagare and Bangalore.

- Interception and diversion project for Bhadra river in Bhadravati city scheduled to be completed in July 2005 was still not complete.
- STP in Davanagere was built after a delay of 4 years due to delay in handing over of land.
- In Bangalore, the I&D Environment Action Plan for rehabilitation of sewers was not yet complete.
- The total sewage generated in Bangalore was 1200 mld and only about 10 *per cent* (120 mld) of this sewage was currently being diverted for treatment.

### Kerala

In Kerala, all the six projects sanctioned for control of pollution of river Pamba being implemented in Pamba city were test- checked in Audit.

- Two of the test checked projects had not yet begun though these were scheduled to be completed by 2007.
- Construction of STPs at Pamba and Sabarimala have not yet commenced due to non-availability of forest land and changes in design of STP.

### Madhya Pradesh

Eight projects for control of pollution of rivers Khan at Indore, Betwa at Vidisha and Kshipra at Ujjain were test-checked in Audit.

- All projects were completed but after significant delays of 3-5 years.
- STP in Indore was treating only 40 mld of sewage and 50 mld of untreated sewage was being discharged into river Khan.
- In Vidisha, STP was not treating the sewage according to its capacity and 1.8 mld of sewage was flowing directly into Betwa.
- In Ujjain, the STP was not being maintained properly and 5 MLD of untreated sewage was being discharged into Kshipra.

### Maharashtra

In Maharashtra, nine projects to control pollution of Krishna and Godavari rivers in the towns of Karad, Nashik, Sangli and Nanded were test checked.

- While seven projects were completed after delays, two were not yet complete.
- In Karad, all the projects was delayed.
- In Sangli city, construction of STP and I&D was not yet complete and the entire 27 mld of untreated sewage of Sangli city was being discharged into the river Krishna.
- In Nashik, STP at Chehdi did not perform to its full treatment capacity and the STP treated only 15 mld sewage.
- In Nanded, the whole intercepting sewer was submerged during the rainy season, increasing possibility/chances of mixing of sewage with river water.

## Odisha

In **Odisha**, Audit test checked seven projects to control of pollution of Mahanadi in Cuttack city and coastal areas in Puri.

- All the projects except those in Puri were completed after significant delays of more than 3 years.
- In respect of STP constructed in Matagajpur, Cuttack, 42.5 mld of untreated sewage was still being discharged into the Mahanadi.
- In Puri, the project, which included construction of I&D, STP & MPS, was scheduled to be completed in 2006 was not yet complete.

## Punjab

In Punjab, eight projects for control of pollution of Sutlej river in Ludhiana and Jalandhar were test checked by Audit. It was observed that projects were completed after delays of more than four years.

- In Jalandhar city, STP at Garha (Pholriwal) was constructed to treat 100 mld of sewage but was treating only 82 mld sewage.
- STPs at Baloke in Ludhiana was also treating only 74 mld of sewage while the STP capacity was 152 mld.
- STP at Jamalpur, Ludhiana was affected due to inflow of industrial waste, delay in chlorination work and non-availability of uninterrupted power.
- Main Pumping Stations at Jamalpur and Baloke were shut frequently due to power cuts, thus affecting their capacity to pump sewage into STPs.

## Rajasthan

In Rajasthan, four projects being implemented for control of pollution of Chambal river in Kota city were test-checked.

- One project was still in progress.
- The projects involving construction of improved wood crematoria /river front development and LCS were completed and working as planned.

## Sikkim

Two projects for control of pollution of Rani Chu river being implemented in Gangtok city were test checked by Audit.



- One project was completed after a delay of 2 years 10 months , the other project was still incomplete, despite scheduled for completion in 2010.
- STP built in Gangtok did not achieve its purpose as sewage of 11 mld was reaching the STP as against the STP capacity of 8 mld and 3 mld of sewage still being discharged into Rani chu.
- The other test checked project 'Rehabilitation of Main Sewer Line and construction of STP is still going on though it was Stated to be completed in July 2010.

### Tamil Nadu

Audit test checked 11 projects in Tamil Nadu for control of pollution of Adyar and Cooum river being implemented in Chennai town, for control of pollution of Cauvery river being implemented in Tiruchirapally and for control of pollution of Vaigai river being implemented in Madurai city.

- Four STPs built to check the flow of untreated sewage from Chennai city in Adyar/Cooum were working as envisaged. However, it was observed that the combined sewage treatment capacity of all the 4 STPs was 481 mld which was inadequate as the estimated sewage flow from Chennai was 731 mld.
- Both the STP and interception and diversion projects in Tiruchirappalli-Srirangam were delayed by two years and 8 months.
- One project in Madurai city for control of pollution of Vaigai river was not completed and work of STP phase 2 was dropped due to non identification of land for STP under NRCD, which was later taken up by Corporation under JNNURM.

### Uttar Pradesh

14 projects for control of pollution of Yamuna river in the city of Ghaziabad, for control of pollution of Ganga river in Kanpur city and for control of pollution of Gomti river in Lucknow city were test checked by Audit.

- Only 9 of these 14 projects were complete and the rest were ongoing, beyond the scheduled date of completion.
- 5 out of 6 projects in Kanpur remained incomplete and continued without extension from MoEF.
- In Ghaziabad, two STPs, at Hindon and in Trans-Hindon were not functioning as per prescribed standards of SPCB , as a result of which the entire untreated sewage was directly being discharged into river Yamuna/Hindon.
- In Lucknow, STP at Daulatganj was not being utilised at its full capacity and was treating only 34 mld of sewage against designed capacity of 42 mld. Further, the treated sewage did not meet standards prescribed by NRCD indicating that the entire un treated sewage of 34 mld was discharged into river Gomti.

## Uttarakhand

Nine projects were test checked in Uttarakhand which aimed to control pollution of river Ganga in Haridwar/Rishikesh, Srinagar and Uttarkashi.

- 7 of 9 projects were completed and the remaining 2 were not yet complete though the scheduled completion date was October 2009.
- In Haridwar/Rishikesh, the project for I&D and STP works at Lakhshman Jhula and Swarg Ashram were scheduled to be completed in October 2009 but were yet to be completed
- STP at Bhopatwala in Haridwar on river Ganga was to be completed in October 2009 but project was yet to start due to non-transfer of land from UP Irrigation Department. As a result of delay in construction of this STP, it was observed that the I&D work at Loknath Nala at Bhupatwala was affected.
- In Srinagar, all projects were completed after delays.
- In Uttarkashi, the capacity of the STP Part I on river Bhagirathi planned to treat 0.25 mld but actually no sewage was being treated.

## West Bengal

10 projects for the control of pollution of river Ganga in Barrackpore, Gayeshpur, Halilshar & Kancharapara and control of pollution of river Mahananda in Siliguri were test-checked in Audit.

- In Siliguri, one project was completed after delay while the status of another project was not clear. The STP was not completed though scheduled date of completion was June 2011. The Main Pumping Station (MPS) for STP-I, II & III was scheduled for completion in October 2007 but was still not complete.
- In Barrackpore, it was observed that though the river front development project (Kolkata) was completed, it was not yet commissioned and was lying unused. Similarly, though the Main Pumping Station was complete, it was not yet commissioned due to the fact that the linked project, i.e., interception and diversion work was not yet complete.
- In Gayespur/Halilshar, the Lifting Stations was yet to be commissioned though these were completed in 2004-2009.

In June 2011, MoEF endorsed the audit findings and stated that after approval of the project, implementation of the project including tendering, execution of works etc., was done by the State Implementing Agency. It further stated that cost and time overruns in projects were due to a variety of reasons which include lack of inter-agency coordination at field level, delays in acquisition of land for STPs & pumping stations, contractual problems, court cases, etc.

MoEF also stated that it had taken several steps to prevent time and cost overrun like signing Memorandum of Understanding and tripartite agreements between the implementing agency, State nodal agency and local body to avoid time and cost escalation.

The reply of MoEF needs to be viewed in light of the fact that almost 83 *per cent* of the completed projects were delayed which points to the fact that measures taken by MoEF to prevent time and cost overruns were ineffective. MoEF's reply also highlights concerns which plague the implementation of projects by State governments which have been planned and funded by the Central government.

## 4.5 Performance of projects undertaken under NLCP

Details of these projects may be seen in relevant State-specific chapters.

### 4.5.1 At the Centre

#### 4.5.1.1 Inadequate Inspection of projects by MoEF

Projects being implemented by the States under NLCP were not being regularly inspected by MoEF. As such, MoEF would be unaware of the difficulties faced during implementation and the opportunity to make mid-course corrections was lost. Out of 22 lakes project test checked, all were not monitored regularly, with most projects being monitored only once during the implementation.

#### 4.5.1.2 In the States

22 lake projects included under NLCP for restoration and conservation across 14 States were test checked by Audit for detailed scrutiny. We observed that out of the test checked 22 projects:

- Only projects relating to two lakes viz, Kotekere and Powai Lake were completed. Projects relating to 18 lakes remained incomplete beyond the date of completion and one lake project was abandoned. The targeted date of completion of one projects (Twin lakes in Mokokchung, Nagaland) was still not over. The extent of delay is depicted in the table below:

**Table 11**

Extent of delay	Number of projects
Between one month and 1 year	Pushkar, Dal lake <sup>10</sup>
More than 1 year to up to 2 years	Shivpuri lake, Mansi ganga
More than 2 years to up to 3 years	Rankala lake
More than 3 years to up to 5 years	Banjara, Sharanabasaveshwara, Veli Akkulam, Bindusagar, Laxminarayanbari, Nainital, Kotekere, Durgabari, Dimsagar lake
More than 5 years	Mansagar, Ravindra Sarovar, Kodaikanal, Mirik lake

- Projects relating to Bellandur lake were abandoned while projects relating to two lakes, viz., Laxminarayanbari and Durgabari lakes in Agartala were yet to commence.
- Of the two completed projects, it was observed that water quality after implementation of the project was restored to the criteria for Designated Best Use classification for B class waters in case of Kotekere lake, while in the case of Nainital Lake, the water quality report of December 2010 revealed that criteria for designated best use classification for B class water for all parameters was achieved except Total Coliform (TC) and Biochemical Oxygen Demand (BOD). Further, in case of Sharanabasaveshwara lake also, there was significant improvement its water quality after the ongoing restoration works.

<sup>10</sup>Has been extended upto 2012.

- Out of test checked lakes, in the case of three lakes namely, Kotekere, Nainital and Twin lakes, Bio-conservation zones around the lake for better safeguard of the lake surroundings from the growing pollution potential and encroachments had not been notified. No information was available for the rest of the projects.

### The success story of the Project to restore Nainital lake:

- Transparency of the lake has increased.
- Decrease in concentrations of toxic gases like carbon dioxide, ammonia, hydrogen sulphide and methane.
- Decrease in concentrations of nutrients like nitrogen and phosphorus.
- No algae bloom observed after aeration.
- Suitable conditions for the growth and breeding of environment friendly fish species like mahseer.
- Concentrations of dissolved oxygen in the lake have increased from the bottom of the lake to the surface.
- No fish fatalities have occurred after the aeration work.
- BOD levels came down from 21mg/lit to 6.8 mg/lit and improvements in other parameters.
- Whole lake catchment area has been covered by sewer line. No sewage is entering the lake.
- Open defecation has been controlled by constructing the community toilets.
- After launching Mission Butterfly, solid waste, garbage of the whole town is being managed in a more sustainable way.
- There is improvement in aesthetic view within periphery of lake.



**Nainital Lake**

Details of implementation of all the test checked lakes/projects are discussed below:

#### **Banjara Lake – Andhra Pradesh**

In February 2005 NRCDC sanctioned the project 'Rehabilitation and Rejuvenation of Banjara lake' at a total cost of ₹ 2.76 crore with scheduled date of completion by August 2006. Work on the project involved activities like construction of STP, lake rejuvenation, lake front development area, establishment of compost plant/laboratory and diversion of storm water drain.

Project not completed due to dispute over the proposed site for sewage treatment plant which was an essential component of the project.

#### **Dal Lake – Jammu and Kashmir**

The project was approved / sanctioned at a cost of ₹ 298.76 crore and the target date of its completion was March 2010, which was extended upto March 2012. The project has two components viz. Lake Conservation Programme and Rehabilitation Programme.

Work on the project suffered due to problems like infirmities in the DPR, inefficient working of Sewage Treatment Plants, non-development of housing colonies under Rehabilitation Programme etc.

#### **Bellandur Lake – Karnataka**

The project for restoration and conservation of Bellandur lake was sanctioned in January 2003 and was slated for completion in August 2004.

- Lake Development Authority, Bangalore (LDA) in June 2004, entrusted execution of work to a contractor, to be completed by January 2005 with commitment that it would take responsibility for stoppage/diversion of sewage entering the lake.
- However, LDA failed to stop/ divert the inflow of sewage in the lake and as a result, oxygenation of the lake proved inadequate and ineffective and rendered the lake non-conductive for bio-remedial treatment.
- The contractor complained in April 2005 against failure to stop sewage inflow. Experts from Indian Institute of Science, Bangalore in May 2005 attributed failure of the project mainly due to discharge of untreated sewage directly into the lake.
- In April 2006, LDA decided to suspend the project till stoppage of sewage inflow was achieved and to go for arbitration regarding the contract and thereafter challenge the arbitral award in High Court of Karnataka. As a result, execution of the project was remained suspended.

#### **Kotekere Lake – Karnataka**

The activities to be undertaken for restoration and conservation of Kotekere lake comprised of construction of STP, Low Cost sanitation, de-silting, de-weeding, lake fencing etc. The

originally sanctioned date of completion of the project was March 2006 but the project was actually completed in May 2009.

- Delay in completion of the project: due to increase in scope of work of de-silting the lake and heavy rains disrupting desilting of lake.
- Activities like construction of STP, construction of low cost sanitation, strengthening of bund, lake-fencing, and shoreline development, de-silting and de-weeding carried out as planned.
- Water quality in Kotekere lake after implementation of the project was restored to the criteria for Designated Best Use classification for B class waters.
- As such, the project had achieved its objective of conservation and restoration of Kotekere lake.

#### **Sharanbasaveshwara Lake - Karnataka**

The activities to be undertaken for restoration and conservation of Sharanabasaveshwara lake comprised of construction of STP, interception and diversion works, low cost sanitation etc., at a sanctioned cost of ₹ 4.89 crore. The originally sanctioned date of completion of the project was September 2006 but the project is still on going and the date of completion had not been revised.

- The project was incomplete due to heavy dewatering and de-silting of the lake.
- Water quality of the lake had improved due to diversion of sewage by the underground drainage system.

#### **VeliAkkulam Lake – Kerala**

The activities to be undertaken for restoration of VeliAkkulam lake included construction of STPs at Ulloor & Valiathura, dredging, bioremediation etc., at a cost of ₹24.56 crore, to be shared 70:30 ratio between the Centre and State. The project was sanctioned in August 2005 and scheduled to be completed in August 2007.

- No work had begun and funds released by MoEF had been deposited into Savings Bank Account in 2006.
- An MoEF site visit report of September 2010 revealed that the de-weeding and de-silting work was under progress but no other activities had been undertaken.

#### **Shivpuri Lake – Madhya Pradesh**

Project under NLCP was sanctioned at a cost of ₹ 51.99 crore for restoration and conservation of Shivpuri lake for completion by August 2009.

- Work on the project involved activities like de-weeding, de-silting, storm water drains, construction of low-cost sanitation, bathing ghats, lake- front development, and public participation. All of these were still incomplete.

### Powai Lake – Maharashtra

The project for restoration and conservation of Powai Lake was sanctioned in June 2001 at an estimated cost of ₹ 6.62 crore with a scheduled date of completion by April 2003. The activities for conservation and restoration included water treatment and bioremediation through de-weeding, de-sludging, aeration, applying special bio-products for treatment and revival of the lake etc.

- The project was declared completed by MoEF despite non-submission of project completion report along with final utilization certificate by the implementing agency (Municipal Corporation of Greater Mumbai) to MoEF.
- Therefore, it is not possible to comment whether the water quality of Powai Lake was restored to the criteria for Designated Best Use classification for B class waters after implementation of the project.

### Rankala Lake - Maharashtra

In October, 2006, MoEF sanctioned a project for restoration and conservation of Rankala Lake to Kolhapur Municipal Corporation at an estimated cost of ₹ 8.65 crore with completion scheduled for January 2009. Some of the activities envisaged under the project included demarcation of lake boundaries, cleaning and removal of aquatic weeds, aquatic plants etc., removing sediments in the lake, desilting of feeder canals, treatment of lake body and lake peripherals etc.

Though the sanctioned period of the project had expired in January 2009, project was still continuing without any extension.

### Twin Lakes (Amok Lushi and Yimdong Awatsung) – Nagaland

The total cost of the project was ₹ 25.83 crore, to be shared in the ratio 90:10 by Government of India and Government of Nagaland. The project involved construction of sewers and manholes, sewage pumping unit, de-weeding, de-silting, storm water management, building check dams/silt traps, measures for shore line protection/stabilization, inlet and outlet management, low cost sanitation works, lake front development, aquaculture etc. The first instalment was sanctioned in October 2009 and the project was scheduled to be completed in two years. The States' share of ₹ 0.65 crore was released in April 2010.

- The two Lakes were selected for this programme even though they did not qualify for selection under NLCP based on the requisite depth criterion, nor on the basis of scientific criteria of discharge of industrial and domestic waste water into the lake and degradation of quality of lake water.
- Joint inspection of the lake site by Audit and State government showed that there was no discharge of any domestic, industrial or municipal waste water into the lake.
- The Nagaland Government could incur an expenditure of ₹ 6.46 crore upto March 2011.

### Bindusagar Lake – Odisha

Bindusagar Lake in Odisha was selected under NLCP for restoration and conservation at the sanctioned cost of ₹3.36 crore. Activities envisaged for restoration and conservation of the lake were providing simple & biological treatment using aquaculture; providing sanitary facilities for pilgrims and community members; restoration of the lake by de-weeding, de-watering & de-silting; aesthetic development & beautification; setting up of an Interpretation Centre etc. The project was to end in 2007 but it was not yet complete.

- Low cost sanitation had not yet been built and the construction of the interception and diversion sewers was also not complete.
- The State government did not provide reasons for non-completion of the project.

### Mansagar Lake - Rajasthan

The project for conservation and restoration of Mansagar Lake was sanctioned in September 2002 by MoEF at an estimated cost of ₹22.39 crore. This was revised to ₹ 24.72 crore in December 2002. The activities for restoration and conservation of Mansagar lake included construction of lake front promenade, construction of check dam in forest valley, construction of three nesting islands, installation of physio-chemical treatment plant, construction of artificial wetland and in-situ bio-remediation system. The scheduled date of completion was March 2004 which was revised to March 2007 but the project is still not declared commissioned /completed. An expenditure of ₹24.72 crore was incurred upto May 2011.

- Project delayed due to delay non- availability of land for construction of physio chemical Treatment Plant.
- BOD levels had improved, but they were still above the danger level indicating high organic pollution.

### Pushkar Lake – Rajasthan

Pushkar lake was facing problems due to siltation, scanty rains, lack of facilities for tourist and consequent degradation of water quality. Hence, it was included under NLCP and a project was sanctioned for its restoration and conservation. The restoration involved activities like de-silting, lake front development, aeration with ozoniser, afforestation, inlet-outlet arrangement etc. The scheduled date of completion was August 2010, but the work was still incomplete.

- Until November 2010 the de-silting work and building of toilets, aeration, construction of inlet-outlet and settling tank was completed.
- The lake front development works, works relating to afforestation were still on going.

### Pichola Lake – Rajasthan

Pichola lake in Udaipur was being subject to heavy anthropogenic pressure by Udaipur city. As such, it was included under NLCP and the Project for conservation and sustainable management of Pichola Lake System was sanctioned in February 2009 at an estimated cost of ₹ 84.75 crore with scheduled date of completion by February 2012.



- An expenditure of ₹3.84 crore was incurred and further progress was not made due to stay granted by the Court for STP land and not demarcating the lake boundary by the Water Resource Department.

#### Kodaikanal Lake - Tamilnadu

The project was sanctioned at the cost of ₹ 5.13 crore and was scheduled to be completed by December 2002. MoEF included it under NLCP and sanctioned a project for its conservation and restoration as domestic sewage from Kodaikanal city was polluting Kodaikanal lake.

- The original site for location of STP for the project for interception and diversion of sewage from 19 outfalls and carry the same to STP was at a site situated near the lake.
- A citizens' group filed a writ petition on the plea that the location of STP would pollute the lake.
- Similar objections were raised on two more locations. As a result, land for the project is yet to be acquired.

#### Dimsagar Lake – Tripura

The project for restoration and conservation of Dimsagar Lake envisaged activities like building of a pathway, retaining wall, drain, weeding, de-silting, sitting arrangement, fencing, landscaping etc. Sanctioned cost of the project was ₹ 0.69 crore and a total of ₹ 0.43 crore had been spent till date. The project was envisaged to be completed in March 2006 but it was still in progress.

- Dimsagar Lake was 3.3 acres and depth was only 1.70 meters and did not qualify for selection under NLCP.
- Approved DPR envisaged the construction of a surface drain from the surrounding residences responsible for pollution of the lake but the Agartala Municipal Corporation could not construct the drain due to encroachments.
- 85 *per cent* of the total expenditure till date had been incurred on beautification and landscaping works and rest 15 *per cent* incurred on measures to control pollution.

#### Laxminarayanbari & Durgabari Lakes- Tripura

Both lakes were included under NLCP with sanctioned cost of ₹0.70 and ₹0.63 crore respectively. Activities for restoration of Laxminarayanbari and Durgabari lakes envisaged construction of pathway, weeding, de-silting, seating arrangement, fencing, landscaping, building of toilets etc.

- Laxminarayanbari was not as polluted as other lakes in Tripura.
- Activities for restoration of the lakes could not commence as a heritage building (royal palace of erstwhile kings' of Tripura) was in close proximity of the lakes.

### Mansi Ganga – Uttar Pradesh

The project for restoration and conservation of Mansi Ganga Lake was sanctioned in March 2007 and was slated for completion in March 2009. Activities under this project included construction of Low Cost Sanitation, lake front development, construction of STP etc. It was observed that the project was still ongoing even though the sanction period of the project had expired.

- With respect to construction of STP, 90 *per cent* progress of the work has been reported till November 2010 by the implementing agency.
- With respect to LCS, only 8 out of the planned 10 LCS units/toilet blocks had been completed till November 2010 as land was not available for remaining 2 units.
- Lake front development work has not yet started and with respect to afforestation, only 40 per cent had been completed till November 2010.
- The delay in implementation of the project was due to non-release of funds by NRCD, delay in obtaining permission from Forest Department, land acquisition for STP.

### Ravindra Sarovar – West Bengal

With a view to improve the quality of water and also to save the lake from further degradation, MoEF sanctioned in October 2002, a project for “Revival of Ravindra Sarovar, Kolkata in West Bengal” at a total cost of ₹ 6.96 crore with scheduled date of completion being March 2004. The expenditure was to be incurred on components like bio-remediation, upkeep, Lake bank protection and fencing and lake beautification.

- Though bio-remediation was originally proposed for improvement of water quality of Ravindra Sarovar as huge numbers of slum squatters were using the lake water for bathing & washing of clothes, the work was not initiated.
- Water quality reports of Jadavpur University Sea Explorers’ Institute, and West Bengal Pollution Control Board for the year of 2007, 2009 and 2010 revealed the presence of BOD, TC and FC in excess of permissible limits.

### Mirik Lake – West Bengal

In August 2004, NRCD sanctioned a project for ‘Revival of Mirik lake’, Darjeeling in West Bengal at total cost of ₹ 4.01 crore with scheduled date of completion being February 2006. The expenditure was to be incurred on components like bank protection, fencing work, construction of silt & debris arrestor, afforestation, de-siltation and public participation.

- MoEF released the first instalment to Kolkata Metropolitan Development Authority (KMDA) which could not be spent.
- KMDA had also not submitted any progress reports to MoEF.
- In September 2008, NRCD intimated the Urban Development Department, Government of West Bengal regarding slow progress of the project and had also requested it to issue instructions for refund of unspent balance to MoEF to prevent any further parking of funds.

#### 4.6 Performance of programmes for control of pollution of ground water

At the central level, MoEF does not implement any programme for treatment and restoration of ground water.

**No State had introduced any specific programmes for the restoration and treatment of ground water. Tamil Nadu and Rajasthan have initiated programmes which address the issue of polluted ground water, but these are restricted to a few specific areas.**

The schemes operated by MoWR focus on exploration, monitoring of the ground water regime through 15640 ground water monitoring wells located all over the country. This data is used for assessment of ground water resources and changes in the ground water regime. Similarly, CGWB seeks to regulate withdrawal of ground water and identify critical and over-exploited areas. However, none of its programmes or studies specifically address the issue of pollution of ground water.

As the ground water in Tamil Nadu contained contaminants like fluoride, salinity, chloride, iron, nitrate etc., it was observed that the State government had initiated Fluorosis Mitigation Project in June 2010 in districts like Dharmapuri and Krishnagiri which were endemic with respect to excess fluoride content in the ground water because of which there was high prevalence of fluorosis in these districts. The scheduled date of completion of the programme was May 2013. The programme is now being implemented with assistance from Japan international Cooperation Agency and was being executed by the Tamil Nadu Water Supply and Sewerage Board. The sanctioned cost of the project was ₹28.44 crore. The technology for fluoride mitigation was adopted by the implementing agency after appropriate study which proved its efficacy. Regular inspection of the facilities set up was taking place by the implementing agency and follow-up was taking place as and when required.

#### Conclusions

*Neither MoEF nor the States have introduced any programmes to prevent pollution of ground water. They have also not addressed the concerns of pollution from agricultural sources.*

*Although accountability structures at the central level have been established for management of pollution of rivers and lakes, the situation is more complicated with respect to groundwater with no central agency taking complete responsibility for ground water pollution. Also, the control activities which ensure accountability of technical and financial aspects of the projects are weak.*

*Although CPCB has created a list of the sources of pollution, MoEF has not created programmes to prevent effluents entering the rivers. NRCD projects dealt only with stretches where pollution has already occurred.*

*Inclusion of rivers and lakes into NRCP and NLCP was flawed as MoEF/CPCB/ States did not conduct a comprehensive survey to assess pollution levels in rivers/lakes all across the country. The total amount of pollutants being discharged into all the rivers of India from sources like industries, mining, tanneries, distilleries etc., was also not worked out before initiation of NRCP/NLCP. Selection of rivers/lakes under NRCP/NLCP was not based on*

*pollution level of the river/lake and NRCP/NLCP was not planned by MoEF to address the reduction of entire pollution of selected rivers and lakes.*

*At the level of the States, implementation of the projects was very unsatisfactory. Projects were delayed beyond the scheduled completion dates and many of them were not completed even as of now, though they were sanctioned more than five years back.*

*Out of the completed projects, 82 per cent of the projects under NRCP were completed after the scheduled date of completion. 28 projects costing ₹251.27 crore were constructed but not utilised as yet. States implementing the projects faced problems in land acquisition, getting requisite permissions, especially forest clearances, technical problems, problems from contractors etc.*

*Many projects faced resistance from local populace, especially for building of STPs. Projects like STPs, LCS, interception and diversion projects failed to function as envisaged, thus being unable to achieve the objectives of pollution control of rivers.*

*Implementation was especially poor in States like Andhra Pradesh, Bihar, Jharkhand, Haryana, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Sikkim, Uttar Pradesh and West Bengal.*

*NLCP as a programme has been ineffective in achieving the objective of conservation and restoration of lakes in India. Only two of the test checked 22 projects had been completed and the rest were either continuing beyond the sanction date of completion or had been abandoned. Problems like resistance from locals over proposed construction of STPs etc., dispute over site, inability to arrest sewage flow, non-availability of land etc., have contributed to non-completion of the projects.*

*As a result, water quality parameters of only three lakes namely Sharanabasaveshwara, Nainital lake and Kotekere lake has been restored to the designated criteria, while these parameters in respect of other lakes like Banjara, Dal, Bellandur, Veli Akkulam, Shivpuri, Powai, Rankala, Mansagar, Pichola, Pushkar, Kodaikanal, Twin Lakes, Bindusagar, Durgabari, Dimsagar and Laxminarayanbari, Mansi Gang and Rabindra Sarovar could not be restored to the designated criteria.*

*Bio-conservation zones have not been notified around the lake to prevent encroachment of lake shoreline.*

*As such programmes to control pollution of rivers and lakes in India have not been implemented adequately.*

### **Recommendation 12**

The Jawaharlal Nehru National Urban Renewal Mission is already funding sewerage projects in some of the same States where funds are being provided by MoEF for the same purpose. MoEF, therefore, needs to focus on projects which seek to regenerate and conserve the river instead of those which focus on treatment of sewage. MoEF/States should conceive programmes which address different sources of pollution flowing into rivers, lakes and ground water with focus being not only on prevention of pollution but also conservation and ecological restoration of our water bodies.

**Recommendation 13**

At present, there are multiple agencies involved in river and lake conservation, right from planning to implementation and monitoring. There is a need to consolidate all these functions and entrust their execution to an umbrella agency for better coordination and accountability.

**Recommendation 14**

In conjunction with the Ministry of Urban Development (MoUD), MoEF and the State should plan drainage for the city as a whole instead of piecemeal approval of random STPs and I&Ds. Further, funding for these projects should come from MoUD as the implementing agencies work under the control of MoUD. MoEF should be involved in the design stage and in monitoring the treated effluents if they are being discharged into the river.

**Recommendation 15**

NRCP should be remodelled to first collect data on the problems affecting each river and then tailor different programmes for each river, depending on the socio-economic context of the area around that river as well as the sources of pollution most affecting the river.

**Recommendation 16**

MoEF/States need to ensure that projects for source control of all kind of pollutants entering the lakes is included in projects for conservation and restoration of lakes, especially sewage and agriculture runoff which leads to nutrient over-loading of the lake.

**Recommendation 17**

States should prepare the Detailed Project Reports for river and lake conservation projects taking into account all the sources of pollution as well as issues like land acquisition while preparing DPRs so that projects are not delayed once started.

**Recommendation 18**

MoEF should ensure that all lakes facing encroachment and resultant filling up are included in NLCP. Further, all State governments should declare bio-conservation zones around lakes so that encroachment of shoreline is prevented.

**Recommendation 19**

MoEF should lay down a time-bound programme in consultation with other Central Ministries, CPCB, States and implementing agencies to ensure that projects are completed in time. There should also be a mechanism for discussions on problems in implementation so that suitable interventions can be made to complete projects in time.