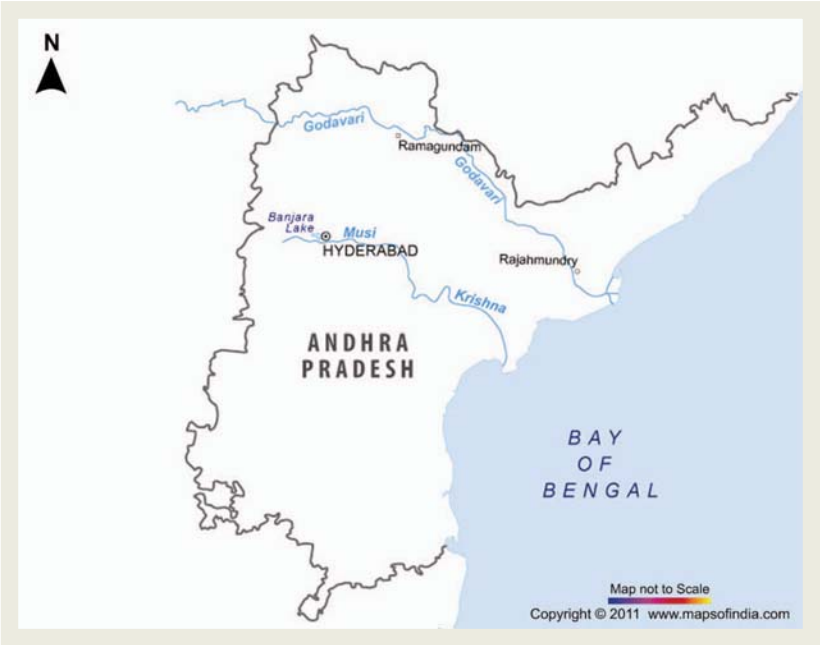
Chapter: 8
State Specific Findings

State: Andhra Pradesh

1. Background

The major two rivers of Andhra Pradesh are Krishna and Godavari stretching thousands of square kilometres of land and creating largest perennial cultivated area in the country. Musi river is a tributary of Krishna and it flows through a major portion of Hyderabad. Some of the lakes in Andhra Pradesh are: Kolleru lake, Hussainsagar Lake, Banjara lake Palair lake, Shamirpet lake, Durgam Cheruvu etc. According to Central Ground Water Board (CGWB), annual replenishable ground water resource in Andhra Pradesh is 36.50 Billion Cubic meters (BCM) while the net annual ground water availability is 32.95 BCM. Out of 1125 mandals, ground water in 219 mandals is over-exploited, 77 mandals is critical and in 175 mandals, it is semi-critical. Ground water in Andhra Pradesh is contaminated by salinity, fluoride, chloride, iron and nitrate.



Rivers and lakes test checked in Andhra Pradesh

Insitutional arrangements in the State: As per information provided by MoEF, Municipal Administration and Urban Development, Government of Andhra Pradesh is the nodal department for NRCP and the implementing agencies are Public Health Engineering Department (PHED) and Hyderabad Metropolitan Water Supply & Sewerage Board (HMWS&SB). Andhra Pradesh Tourism Development Corporation (APTDC), Hyderabad is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Andhra Pradesh is discussed below:

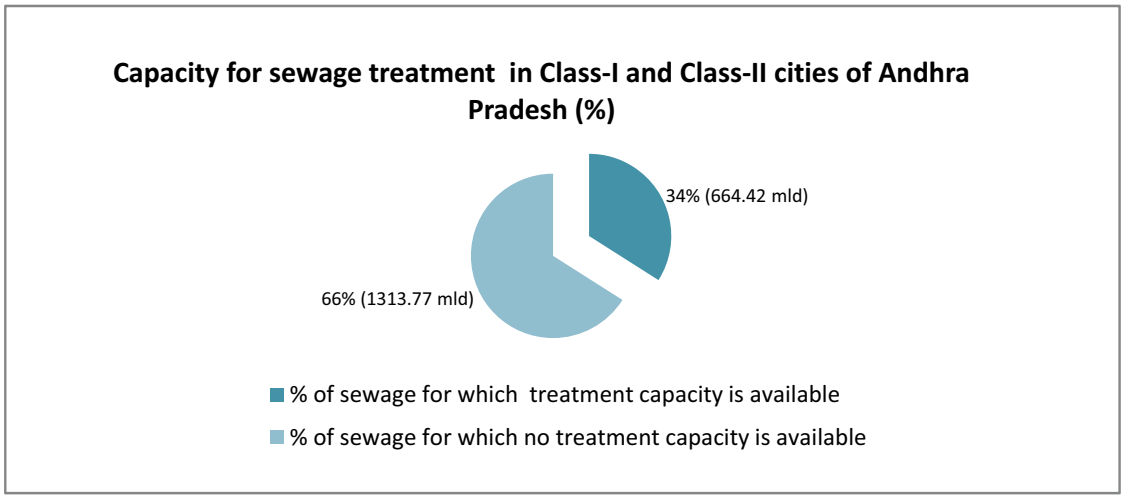
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Done	Could not be verified	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Not Done	Done (arsenic, nitrate, iron, fluoride and salinity)

	b) According to Biodiversity indicators	Done	Done	Not applicable
	c) Quantification of contaminants	Done	Done	Could not be verified
	d) Assessment of impact of human activities	Partially (Agriculture: Done, Industry: Done, Mining: could not be verified, Dam: Done, Uncontrolled disposal of human waste: Could not be verified)	Partially (Agriculture: Done, Industry: Done, Uncontrolled disposal of human waste: could not be verified)	Partially (Agriculture: Done, Industry: Done, Mining: could not be verified)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Could not be verified	Could not be verified	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Could not be verified	Could not be verified	Could not be verified
5. Programmes for prevention and control of water pollution		Partially (Source water protection: could not be verified, Industry: Done, Agriculture non point sources: Done)	Could not be verified	Done
6. Constitution of Water Quality Review Committee		could not be verified		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Andhra Pradesh



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Andhra Pradesh is 1978.19, out of which treatment capacity is available for only 664.42 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Godavari and Musi rivers had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects are being implemented in five cities[11] on river Godavari and in Hyderabad on river Musi. 25 projects[12] in these five towns were sanctioned under NRCP and sanctioned cost of all the projects was ₹367.51 crore. Expenditure of ₹ 342.48 crore was incurred under NRCP as of March 2010.

6 projects[13] being implemented under NRCP at a cost of ₹ 351.54 crore were test checked for detailed examination. **Results of audit examination are discussed below:**

(i) Physical and financial progress

Name of the river/ location	Name of the project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Godavari at Ramagundam	STP Zone I	0.36	0.16	June 2004	June 2008
	I&D	2.62	1.50	September 2004	Work stopped due to objections raised for safety of coal mines in April 2006
	STP Zone II	1.19	0.82	December 2003	January 2005
	STP WSP 14	0.79	0.45	October 2004	Work stopped due to objections raised for safety of coal mines in April 2006
Godavari at Rajamundry	STP	10.92	10.48	September 2004	March 2010
Musi at Hyderabad	4 STPs, 16 I&Ds and 10 Sewer lines	335.66[14]	281.50	August 2008	For STPs: February 2009, November 2009, June 2009 and one still ongoing For 16 I&Ds and 10 Sewer lines: four delayed

(ii) Performance of projects

(a) Ramagundam

The average sewage generated in the city of Ramagundam is 15 mld. However, only 4.5 mld is treated and the rest 10.5 mld is discharged into the Godavari. Details of four projects test checked in Ramagundam which aim to improve the quality of water in Godavari are discussed below:

Project	Findings
STP	• This project scheduled for completion by June 2004 was completed in

[11] viz. Bhadrachalam, Mancherial, Rajamundry,Hyderabad and Ramagundam
[12] The project on Musi River consist of 30 sub-projects (4 STPs, 16 I&Ds and 10 Sewer lines)
[13] Five projects on Godavari river and one project (consisting of 30 sub-projects) on Musi river
[14] Including land acquisition at a cost of ₹ 37.03 crore

Zone 1	June 2008 after a delay of four years. No information was available regarding submission of completion report and final utilisation certificate to MoEF. • Separate information was not available with the State regarding actual funds spent on the project. • This project was delayed due to water logging conditions, shortage of labour and land acquisition issues. • Though STP capacity was four mld, only one mld was being treated and the rest three mld was flowing into Godavari. No information was available whether the treated sewage met the standards for pH, Total Suspended solids (TSS), Oil & Grease, BOD and COD. The pump sets were not working which hampered the operation of the STP. After its completion, it was not assessed whether the STP was meeting the performance criteria set for it. **As such, it is evident that the STP was not fulfilling the purpose for which it was constructed.**
STP Zone 2	• The project was completed in January 2005 after a delay of one year and one month. The completion certificate was submitted to MoEF in December 2005 but final Utilisation Certificates have not yet been submitted. • This project was delayed due to problems in acquisition of land. • Though the STP was constructed to treat 14 mld of sewage, it was treating only 3.5 mld and the rest 10.5 mld was flowing untreated into the Godavari. No separate information was available whether the treated sewage met the pH, Total Suspended Solids (TSS), Oil & Grease, BOD and COD standards. Pump sets were not working which hampered the operation of the STP. **As such, it is evident that the STP was not fulfilling the purpose for which it was constructed.**
I&D	• Though the project was originally to be completed by December 2000 , it was extended upto September 2004. • The work was stopped in April 2006 due to objection raised for safety for coal mines by authorities of Singareni Collieries Company Limited. • In Zone-I the pumps were not in running condition and in Zone-II, the pumps were found missing and the pump house was not put to use.The State government had not taken any action to rectify the problem. • 1443 RMT of pipes were to be laid under the project, however, only 888 RMT were laid as yet. **As such, the project failed to fulfill the purpose for which it was constructed.**
STP WSP 14	The project was abandoned due to objection raised for safety of coal mines by the authorities of Singareni Collieries Company Limited in April 2006.

(b) Rajamundry

The daily average sewage generated in the city of Rajamundry is 30 mld and the entire 30 mld is treated. Details of project test checked in Rajamundry city which aim to improve the quality of water in Godavari are discussed below:

Project	Findings
STP	• The project scheduled for completion by September 2004 was completed in March 2010 after a delay of five and a half years. No information was available regarding submission of completion report and final UCs to MoEF, even though the project was completed. • The delay was due to submerging of site, unavoidable climatic conditions like heavy rains, scarcity of skilled labour for this type of specialized work etc. • It was proposed to generate biogas from the STP, however, this was not done due to non-connection of household sewage to the STP through the underground drainage network.

(c) Hyderabad

The average daily sewage generated in Hyderabad city is 950 mld, however, treatment capacity exists only for 541 mld but only 407 mld of sewage is treated. As a result, 543 mld of sewage daily flows into Musi river. 23 drains from Hyderabad city open into the Musi but only 17 have been intercepted and six drains were yet to be intercepted. Under NRCP, projects consisting of construction of four STPs, 16 I&Ds & 10 sewer lines were sanctioned in April 2004 at an estimated cost of ₹ 335.66[15] crore. Some of the projects test checked in Hyderabad which aimed at improving the quality of water of Musi River are discussed below:

Project name	Findings
STP, Nagole	• The project scheduled for completion by August 2008 was finally completed in November 2009 after a delay of one year & three months. • Against the original cost of ₹ 47.64 crore, expenditure of ₹ 59.47 crore was incurred on the project. The cost of the project also escalated by 11.83 crore due to increase in quantities of mechanical, electrical, safety and civil works. • The project was delayed due to delay in procurement of bio-gas set with improved designs and specifications from Austria. • The constructed STP with a capacity of 172 mld was treating only 150 mld due to the daily generation of sewage being less than capacity created. 114 mld of untreated sewage from Murki Nala, which was supposed to be diverted to STP Nagole was being let out into Musi River without treatment. Consent was taken from SPCB for construction and operation and it was regularly being inspected by it.
STP, Nallacheruvu	• The project was completed in February 2009 after a delay of six months. • Against the original cost of ₹ 11.33 crore, expenditure of ₹ 15.77 crore was incurred on the project. The cost of the project escalated by ₹ 4.44 crore due to revision of rates.

[15] Includes cost of land acquisition

	• The project was delayed due to delay in preparation of structural drawings, increase in quantities and supplementary items of work, delay in handing over of site etc. • The STP capacity created was 30 mld but the STP was treating only 14 mld due to less receipt of sewage.
STP, Amberpet	• This was completed in June 2009 after a delay of 10 months. Against the original cost of ₹ 93.51 crore, expenditure of ₹ 112.94 crore was incurred on the project. The cost of the project escalated by ₹ 19.43 crore due to reasons like providing power distribution scheme, laying of power cables, construction of administrative building, painting for gas dome etc. • The project was delayed due to problems in land acquisition, increase in quantum of work, hard rock excavation in lagoon, heavy seepage and heavy rains etc. • Though the capacity of the STP was to treat 339 mld of sewage, it was treating only 241 mld and 178 mld was being discharged into Musi. This was due to non-completion of I&D project at Surplus nala.
STP, Attapur	• This project was envisaged to be completed in August 2008 but is still not complete. • Against the original cost of ₹ 23.55 crore, expenditure of ₹ 4.50 crore was incurred on the project. • The project was delayed due to land acquisition issues and non-availability of approach road to STP site • Because of non-completion of STP, three I&D structures were not being put to use and 82.7 mld of untreated sewage was being discharged into Musi river daily.
I&D, Surplus Nala	• This was scheduled to be completed in August 2008 but is still not complete. • Total expenditure of ₹ 2.10 crore was incurred on the project. • The project was delayed due to objection from grass growers at the site, heavy seepage and hard rock, frequent rains and reformation of coffer dam which collapsed due to abnormal flood along the length of nala. • Due to delay in its construction, STP Amberpet was affected and 178 mld of sewage was being discharged into Musi without treatment due to non-completion of I&D.
I&D, Murkinala near Chaderghat Bridge	• This I&D work to divert sewage to STP Nagole for treatment was completed in February 2008. • An expenditure of ₹0.86 crore was incurred on th project. • The I&D work was not put to use due to laying of pipe lines under another work under JNNURM programme. As a result, 114 mld of untreated sewage was being let into river Musi, rendering the entire expenditure of ₹0.86 crore unfruitful, besides polluting Musi river.

I&D,Bahadurpura and Mughal ka nala	• Bahadurpura nala and Mughal ka nala were completed in July 2008. • An expenditure of ₹ 0.61 crore and ₹ 0.35 crore was incurred. • Pumping stations, each having capacity of 40 mld and 30 mld created under the project were not being utilized due to non completion of STP at Attapur.

Thus, projects sanctioned to control pollution of Godavari and Musi rivers had not adequately achieved their objectives.

Blocked I&D at Murinala in Hyderabad

Blocked I&D works at Afzal Sagar I&D in Hyderabad, Andhra Pradesh

4.2 NLCP

One project being implemented under NLCP at a cost of ₹ 4.30 crore was test checked for detailed examination.

(i) Physical and financial progress

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Banjara lake	2.76, revised to 4.30	0.18	August 2006 revised to May 2010	On-going

The project is discussed below:

Project name	Findings
Banjara Lake in Hyderabad	• The work on the project involved activities like construction of STP, lake rejuvenation, lake front development, establishment of compost plant/ laboratory and diversion of storm water drain. • The project was to be completed by August 2006 which was revised to May 2010. However, it was still ongoing. • The sanctioned cost of the project was₹ 2.76 crore which was revised in May 2009 by NRCD to ₹ 4.30 crore. Against release of ₹ 80 lakh, expenditure of ₹ 17.61 lakh was incurred on the project and balance of ₹ 62.39 lakh was lying unspent. • The project was not completed due to dispute over the proposed site for sewage treatment plant which was an essential component of the project. The STP was also not completed. • Andhra Pradesh Tourism Development Corporation (APTDC), Hyderabad was the implementing agency for the project. The work was transferred to the Hyderabad Metropolitan Water Supply and Sewerage Board (HMWS&SB), Hyderabad during March 2010 for execution. An amount of ₹ 31.20 lakh was remitted by APTDC to HMWS&SB, Hyderabad in August 2010 and a balance of ₹ 31.20 lakh (along with interest) was still lying with APTDC. The actual execution of project has commenced from August 2010 by HMWS&SB. **Thus, the work of conserving the Banjara lake was incomplete even after extension of period by four years and seven months.**

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
1 out of 6 projects	1 out of 6 projects	0 out of 6 projects	0 out of 6 projects

5.2 NLCP

By inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 1 project	0 out of 1 project	0 out of 1 project	0 out of 1 project

5.3 Ground water (in test checked six blocks)

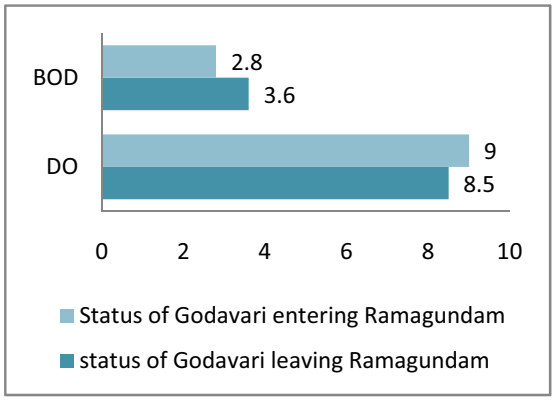
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes	Yes

6. Outcomes

6.1 NRCP

(a) Water quality of Godavari after Ramagundam

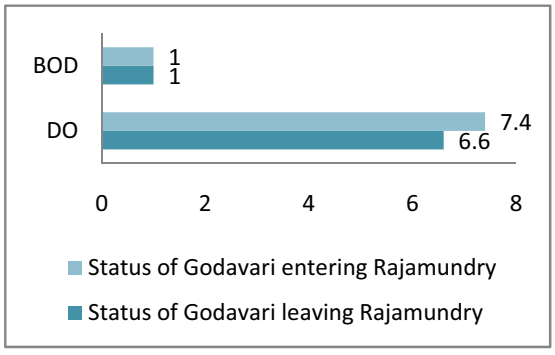
Status of Godavari on entering and leaving Ramagundam in terms of DO and BOD is shown in the chart alongside. It can be seen that BOD actually rises after Godavari leaves Ramagundam, highlighting the inadequate sewage treatment facilities.



BOD is on the slightly higher side but TC is more than 3.2 times the criteria indicating the water of Godavari after leaving Ramagundam city is contaminated by harmful, fecal-related bacteria, viruses and protozoa which cause illness

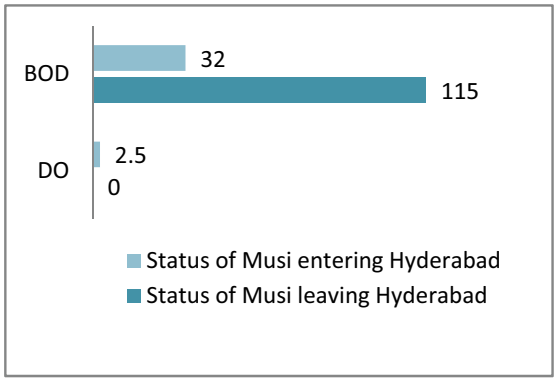
(b) Water quality of Godavari after Rajamundry

Status of Godavari entering and leaving Rajamundry in terms of DO and BOD is shown in the chart opposite.



(c) Water quality of Musi after Hyderabad

Status of Musi entering and leaving Hyderabad in terms of levels of BOD and COD is shown in the chart opposite. Further, levels of Fecal Coliform increase in Musi after Hyderabad; indicating contamination of the water by fecal matter. Further, the Dissolved Oxygen of Musi river falls to 0 after it leaves Hyderabad, indicting the inability of Musi to support any aquatic life. BOD was more than 38 times the criteria, indicating high levels of organic pollution of Musi river after it leaves Hyderabad.



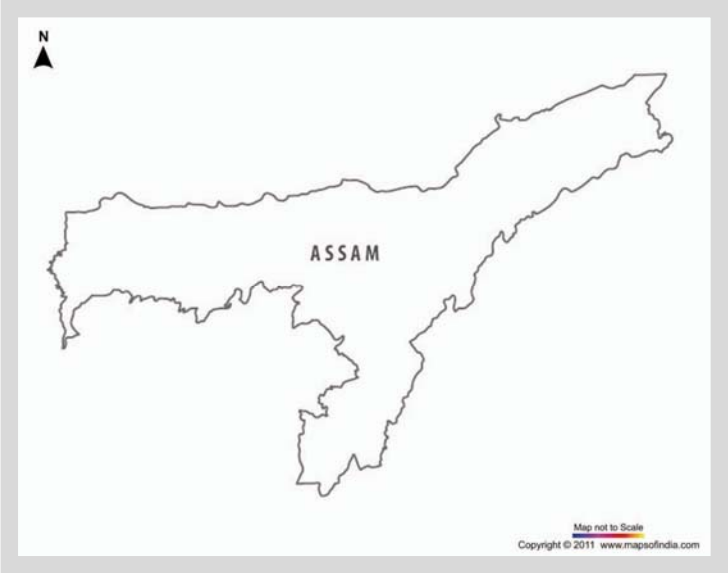
6.2 NLCP

As the project on improving water quality of Banjara lake is still in progress, no conclusions could be drawn about impact of NLCP in restoring the lake.

State: Assam

1. Background

Some of the important rivers of Assam are Brahmaputra, Burhidihing, Dhansiri, Dihing, Manas etc. Some of the lakes in Assam are Deepor Beel, Sareswar beel, Morikolang beel, Maguri beel, Diplai beel, Hakma beel, Sivasagar and Joy Sagar etc. According to central Ground Water Board, the annual replenishable ground water resource in the State is 27.23 BCM and net annual ground water availability is 24.89 BCM. Out of 23 districts in the State, none of them are over-exploited, critical or semi-critical with regard to ground water. Contaminants like fluoride, iron and arsenic affect parts of some districts in Assam.



No river and lake under NLCP and NRCP selected

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Assam is discussed below:

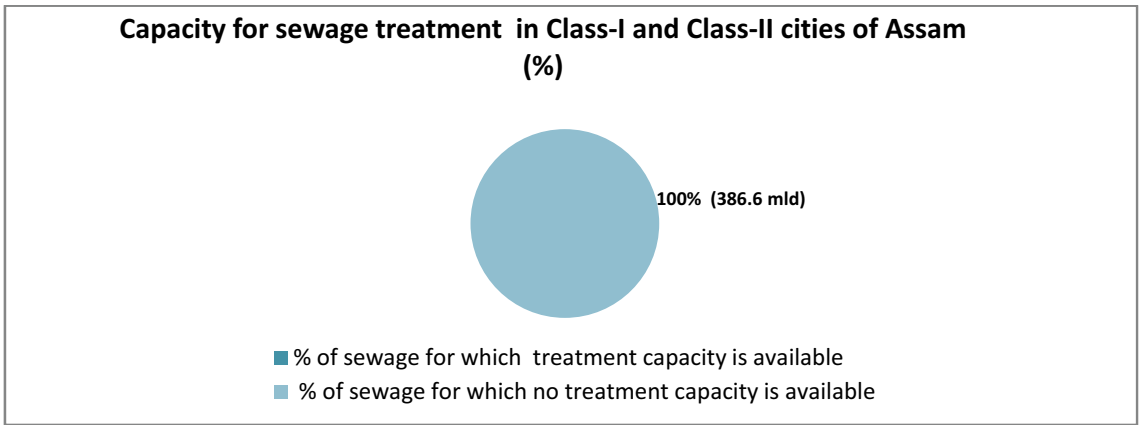
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Not Done	Not Done
2. Assessment of water quality	**a) According to chemical Indicators**	Could not be verified	Could not be verified	Could not be verified
	b) According to Biodiversity indicators	Not Done	Could not be verified	Not applicable
	c) Quantification of contaminants	Could not be verified	Could not be verified	Could not be verified
	d) Assessment of impact of human activities	Partially (Agriculture: Done, Industry: Done, Mining: Could not be verified, Dam: Not Done, Uncontrolled disposal of human waste: Not Done)	Could not be verified	Partially (Agriculture: Not Done, Industry: Done, Mining: Not Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Could not be verified	Not applicable
	c) Risks to human health	Not Done	Could not be verified	Done
4. Policy for water pollution		Not Done	Not Done	Not Done

5. Programmes for prevention and control of water pollution	Partially (Source water protection: Not Done, Industry: Done, Agriculture non point sources: Not Done)	Could not be verified	Partially (Industry: Done, Agriculture non point sources: Not Done)
6. Constitution of Water Quality Review Committee	Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Assam



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Assam is 386.60 mld, for which no treatment capacity is available.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Even though two rivers in Assam, Bharalu and Kalong figured in the list of most polluted rivers in India, these rivers were not selected under NRCP.

4.2 NLCP

Lakes like Dhir beel, Dighali beel and Sareswar beel were identified by NRCD in its list of polluted lakes. Further, the State in addition to the above-mentioned lakes, had also identified lakes like Morikolang beel, Maguri beel, Diplai beel, Hakma beel, Sivasagar and Joy Sagar as polluted. However, none of these lakes were included for restoration and conservation under NLCP.

5. Monitoring of programmes for control of water pollution

5.1 Ground water (in test checked six blocks)

System for monitoring	Whether monitoring done	Whether laboratories established	Whether Field Testing Kits issued
System existed in four blocks	Partially (taking place in four blocks, not being done in one block,could not be verified in one block)	Partially (established in five out of six blocks and for one block, no information was available)	Partially (made available to all the panchayats in four blocks, sufficient FTKs were not supplied in one block and no information was made available in one block.)

State: Bihar

1. Background

Ganga is the main river of Bihar. Some other rivers are Saryu (Ghaghra), Gandak, Budhi Gandak, Bagmati, Kamla-Balan, Mahananda, Sone, Uttari Koyal, Punpun, Panchane and Karmnasha. Some of the lakes in Bihar are Kanwar lake, Upper lake and Lower lake, Muchilinda Lake, Sagar Pokhar, Harahi Pond, Kabar Tal etc. According to CGWB, the annual replenishable ground water resource in Bihar is 29.19 BCM and the Net Annual ground water availability is 27.42 BCM. In none of the blocks in Bihar is the ground water over-exploited, critical or semi-critical.

Rivers test checked in Bihar

Insitutional arrangements in the State: As per information provided by MoEF, Department of Urban Development, Government of Bihar is the nodal department and the implementing agency is Bihar Rajya Jal Parishad (BRJB), Bihar for NRCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Bihar is discussed below:

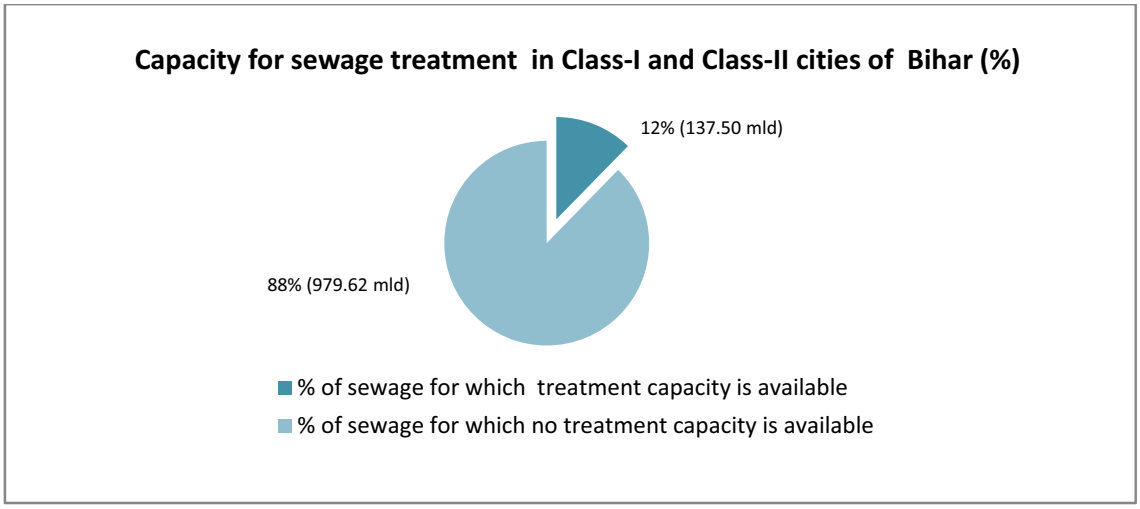
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Could not be verified	Could not be verified	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Could not be verified	Done
	b) According to Biodiversity indicators	Done (for two rivers)	Could not be verified	Not applicable
	c) Quantification of contaminants	Partially (Nutrients: Could not be verified, Pathogenic organism: Done, Human produced chemicals: Done)	Could not be verified	Could not be verified

	d) Assessment of impact of human activities	Could not be verified	Could not be verified	Could not be verified
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Could not be verified	Not applicable
	c) Risks to human health	Not Done	Could not be verified	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Could not be verified	Could not be verified	Could not be verified
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Bihar



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Bihar is 1117.12 mld, of which treatment capacity is available for only 137.50 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

(a) Planning for NRCP

Ganga river had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects were being implemented in 14 cities[16]. 18

[16] viz. Arrah, Barahaya, Barh, Bhagalpur, Begusarai, Buxar, Chapra, Fatwah, Hazipur, Kahelgaon, Mokamah, Munger, Patna and Sultanganj.

projects in these 14 cities were sanctioned under NRCP. The total sanctioned cost of all the projects was ₹ 3.95 crore.

Six projects[17] being implemented under NRCP at a cost of ₹ 2.17 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Ganga at Barahaya	LCS Barahaya	0.10	0.10	August 1997 revised to February 2003	December 2002
	RFD Barahaya	0.30	0.28	August 1997 revised to February 2003	February 2003
Ganga at Patna	RFD, Patna	0.75	0.65	September 1996 revised to February 2003	April 2003
	RFD Danapur	0.30	0.29	December 2002	May 2007
	RFD Gulbi Ghat, Patna	0.19	0.15	December 2002	Yet to be completed
	Diesel crematoria, Danapur	0.53	0	September2003	Yet to commence

(ii) Performance of the projects

(a) Barahaya

The average sewage generated in the city of Barahaya is 4.5 mld, none of which is treated. However no amount is discharged into the Ganga river, since Ganga river has moved away from the city and as reported the city has around 25 drains which fall in a ditch away from the city. Details of two projects test checked in Barahaya which aim to improve the quality of Ganga's water quality are discussed below:

Project	Findings
LCS	• The project was to be completed in August 1997 but the date was revised to February 2003.The project was actually completed in December 2002. The final UC was submitted to MoEF in April 2008. • The total number of LCS units set up was three units of five seats each and all were found to be functioning. • In contravention to NRCD guidelines, LCSs were constructed in Government high schools and in certain colony instead of at the banks of River Ganga. The responsibility for O&M of each asset created under NRCP was allocated by the State to Nagar Punchayat, Barahaya and it carried out regular operation and maintenance. There was no information on the assessment of the completed projects by the State on basis of set targets/ performance milestones.
RFD	• Originally sanctioned date of completion of the project was August 1997 which was revised to February 2003.The project was actually completed in February 2003 .

[17] Two projects in Barahaya and four projects in Patna.

	• Under the project two ghats were constructed (Vijaygarh ghat and Sojikipari ghat). But both the ghats are not existing as the course of Ganga has shifted from the purported sites and both the ghats were completely destroyed and non existing due to erosion.

(b) Patna

The daily average sewage generated in the city of Patna is 236 mld and the total sewage treated is 68.67 mld. The amount of untreated sewage discharged into the river Ganga is 167.33 mld. Total numbers of drains falling into the river were 29 while a total of three drains intercepted. Details of four projects test checked in Patna which aim to improve the quality of Ganga's water are discussed below:

Project name	Findings
RFD,Patna	• The originally sanctioned date of completion of the project was September 1996 but the same was revised to February 2003 and was actually completed in April 2003. • 7 ghats were created under the project but River Ganga had shifted from Kurjee Ghat, Rajendra Ghat and Indira Ghat and these ghats are defunct. The Collectorate Ghat and Narkat Ghat, where Ganga is still flowing, are not maintained and, thus, in deplorable condition. Mahavir ghat, which was constructed under this project was destroyed and is being redeveloped under another scheme. • The reasons given for lack of proper maintenance of the assets created were that Patna Municipal Corporation was not maintaining these ghats, there was encroachment of river banks and the River Ganga has shifted.
RFD,Danapur	• The originally sanctioned date of completion of the project was December 2002 and it was actually completed in May 2007 but the completion report was not sent to NRCD. • The project was delayed due to delay in publishing NIT and awarding contract and delay in release of fund for electrification. • The river front is not being maintained properly and it was not handed over to Danapur Cantonment Board (local body). • RFD is now completely defunct, the changing room was in a dire state, staircases have been buried under thick layer of sand/mud and the electric poles have been uprooted and electric lamps are broken.
RFD, Gulbi Ghat	• The sanctioned date of completion of the project was December 2002. However, the project was incomplete. • The reasons for the delay in completion were delay in publishing NIT and award of contract, non- inclusion of approach road in the original DPR and the revised cost estimate not being sent to NRCD.
Diesel Crematoria	• The originally sanctioned date of completion was September 2003 but the project has not yet been undertaken due to indecision of the State and NRCD whether to install diesel crematoria or electric crematoria.

Incomplete RFD at Gulbi ghat, Patna

LCS at Barahaya

4.2 NLCP

There was no lake in Bihar in the list of polluted lakes as issued by the MoEF, but there were three lakes listed as polluted by the State government which was sent to MoEF. These were Motijheel at Motihari, Baraila chaur at Vaishali and Manjheel at Muzaffarpur. However, none of these lakes were selected for conservation and restoration under NLCP.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
5 out of 6 projects	0 out of 6 projects	0 out of 6 projects	0 out of 6 projects

5.2 Ground water (in test checked six blocks)

Six blocks were chosen for assessment of monitoring network with respect to ground water. These were: Simri (arsenic affected), Katoria (fluoride affected), Barauni (industrial cluster), Mushahari (industrial cluster), Maner (randomly selected) and Biraul (randomly selected).

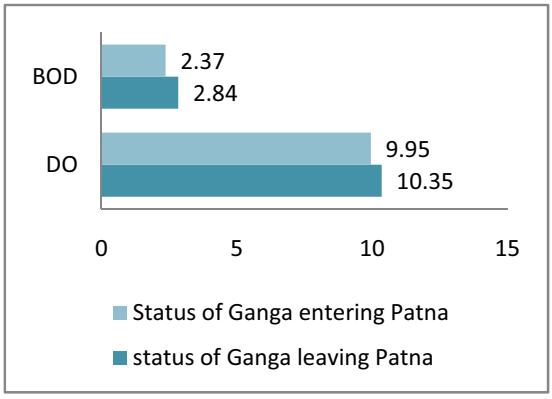
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes, Qualified staff was appointed in these laboratories except in Katoria block.	Yes, made available to all the panchayats in the block/district by the State government except for Katoria and Mushahari block but these were not utilised by the panchayats.

6. Outcomes

6.1 NRCP

(a) Water quality of Ganga after Patna:

Dissolved oxygen (DO), Bio chemical Oxygen demand (BOD) measured in the river at the time of its entering the city and its leaving the city is shown in the graph alongside. Total Coliform was 34 times the criteria in Ganga after it leaves Patna, indicating the presence of disease causing, fecal-related bacteria, viruses and protozoa which cause illness.



State: Chhattisgarh

1. Background

Mahanadi and Narmada are the principal rivers of Chhattisgarh. Other rivers of the State are Godavari, Brahmani, Sheonath, Indravati etc. Some of the lakes in Chhattisgarh are Vivekananda lake (Burra Talao), Khamhardih lake, Telibandha pond, Maharajabandh pond, Tikarapara pond, etc. According to Central Ground Water Board, annual replenishable ground water resource in Chhattisgarh is 14.93 BCM while the net annual ground water availability is 13.68 BCM. Out of 146 blocks in Chhattisgarh, ground water is not over-exploited or critical in any of the blocks, while in eight blocks it is semi-critical. Ground water in Chhattisgarh is contaminated by fluoride, iron, arsenic and nitrate.

No river or lake selected under NRCP and NLCP in Chhattisgarh

Institutional arrangements in the state: No river/lake has been selected for restoration under NRCP/NLCP in the state.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Chhattisgarh is discussed below:

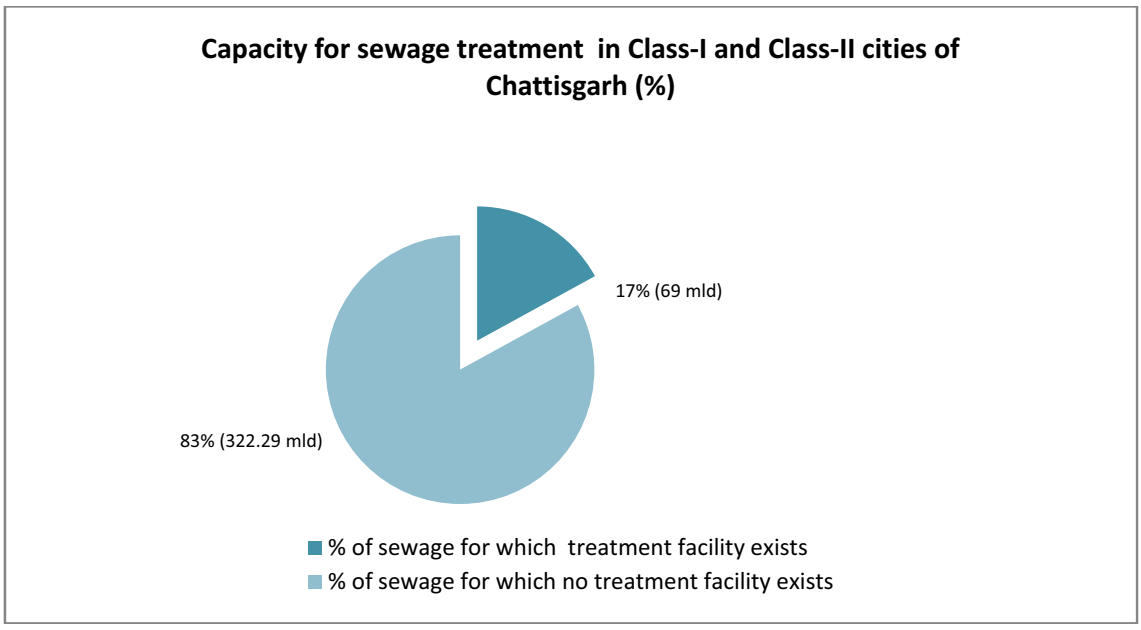
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Not Done	Not Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Not Done	Not Done except for nitrate
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified
	d) Assessment of impact of human activities	Could not be verified	Could not be verified	Could not be verified
3. Identification of risks to	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable

environment and health	**b) Risks to aquatic species**	Could not be verified	Could not be verified	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Could not be verified, Industry: Could not be verified, Agriculture non point sources: Could not be verified)	Could not be verified	Partially (Industry: Not Done, Agriculture non point sources: Could not be verified)
6. Constitution of Water Quality Review Committee		Not Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Chattisgarh



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Chattisgarh is 391.29 mld, of which treatment capacity is available for only 69 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

No rivers were included under NRCP.

4.2 NLCP

Vivekananda lake (Burra Talao) was identified by NRCD in its list of polluted lakes. Further, in addition the State government had also identified four other lakes as polluted. These were Khamardih lake, Telibandha pond, Maharajabandh pond, and Tikarapara pond. However, none of these lakes were included for restoration and conservation under NLCP.

5. Monitoring of programmes for control of water pollution

5.1 Ground water (in test checked six blocks)

Six blocks were chosen for assessment of monitoring network with respect to ground water. These were: Bastar, Chowki (fluoride/arsenic affected) Kartala, Baikunthpur, Bagicha (randomly selected) and Korba (selection from industrial cluster). Out of these six blocks, Korba ranks 5th in most polluted in the list of industrial clusters[18] which are severely affected by pollution.

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes	Yes

[18] According to CPCB

State: Delhi

1. Background

Delhi is situated on the western banks of river Yamuna. The other major sources of water include the Agra Canal, Hindu Canal and the Western Canal. Some of the lakes in Delhi are Bhalswa lake, Purana Qila lake, Roshnara Garden tank etc. According to Central Ground Water Board (CGWB), the annual replenishable ground water resource in Delhi is 0.30 Billion Cubic Meters (BCM) while the net annual ground water availability is 0.28 BCM. Out of 9 districts in Delhi, ground water is over-exploited in 7 blocks. Some of the contaminants that affect ground water in Delhi are salinity, fluoride, chloride and nitrate.

Test checked river in Delhi

Insitutional arrangements in the State: As per information provided by MoEF, the nodal agency was Government of NCT, Delhi and the implementing agencies for NRCP were Delhi Jal Board and Municipal Corporation of Delhi.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Delhi is discussed below:

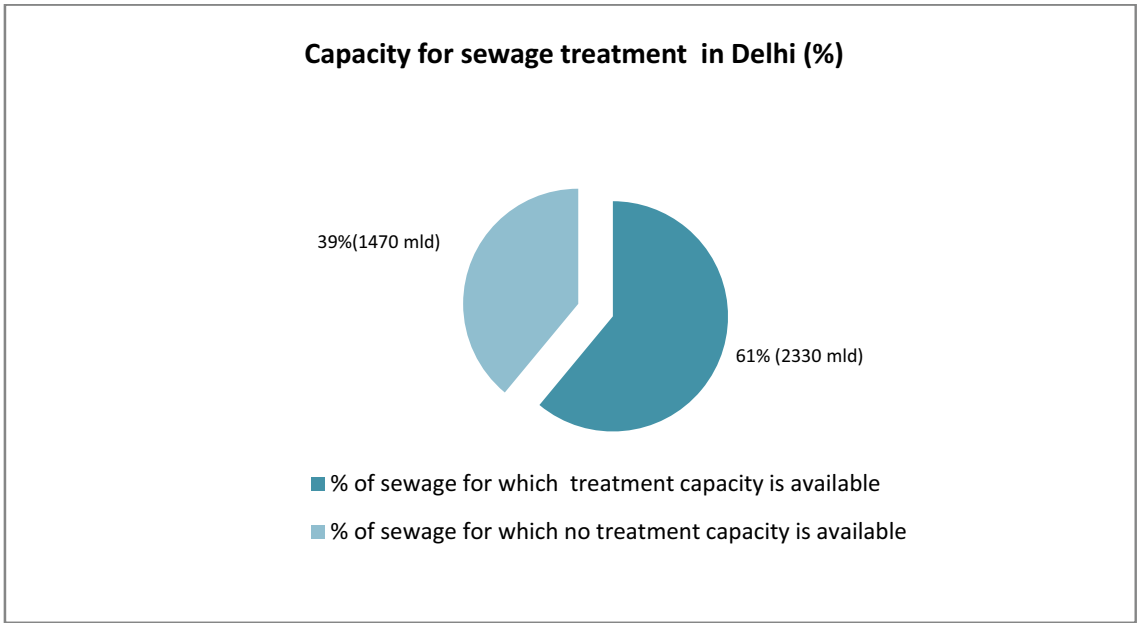
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Not Done	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Not Done	Done
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified.
	d) Assessment of impact of human activities	Partially (Agriculture: Not Done, Industry: Done, Mining: Not Done, Dam:	Not Done	Partially (Agriculture: Not Done,

		Not Done, Uncontrolled disposal of human waste: Not Done)		Industry: Done, Mining: Not Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Not Done, Industry: Done, Agriculture non point sources: Not Done)	Not Done	Partially (Industry: Done, Agriculture non point sources: Not Done)
6. Constitution of Water Quality Review Committee		Not Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Delhi



[Source: CPCB data, 2005-06]

The total sewage generated in Delhi is 3800 mld, of which treatment capacity is available for only 2330 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Yamuna River had been selected for pollution abatement projects under the National River Conservation Programme **(NRCP)**. 23 projects in Delhi were sanctioned under NRCP out of which 12 were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 650 crore. 10 projects being implemented under NRCP at a cost of ₹ 89.77 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Yamuna/ Delhi	STP Sen Nursing Home	6.21	5.39	December 1996	September 2001
	STP Delhi Gate Nala	7.57	6.31	December 1996	January 2002
	Electric Crematoria	1.45 revised to 1.78	1.78	March 2002	June 2002
	STP 3 mld FAB technology	1.78	1.83	March 2002	December 2002
	STP 3 mld SAFF technology	1.86	1.93	March 2002	December 2002
	STP 2 mld SAFF technology	1.47	1.28	March 2002	March 2003
	LCS	1.49	1.65	March 2002	February 2003
	2 mld disinfection plant at Sen Nursing Home	0.42	0.45	February 2002	March 2002
	Public Participation and Awareness	2.16	1.26	March 2002	ongoing
	STP 135 mld	65.03	79.54	June 2010	On going

(ii) Performance of the projects

Details of ten projects test checked in Delhi which aim to improve the quality of water in the Yamuna are discussed below:

Project name	Findings
10 mld STP at Sen Nursing Home	• The project was scheduled for completion by December 1996 but it was actually completed in September 2001 after a delay of more than four years and nine months. • The project was delayed due to non-approval of layout plan & hydraulic flow design, shortage of cement at central cement stores, heavy rains etc. • The capacity of created STP was 10 mld where as the total sewage generated was around 60-70 mld.This indicated that rest of 50-60 mld untreated sewage was being discharged into the river.

STP, Delhi Gate Nala	• The STP was required to be completed by December 1996 but it was completed in January 2002 after a delay of more than five years. • The project was delayed due to non-availability of site, delay in approval of lay out plan, monsoon period and non-availability of cement at Central Cement Stores. • The capacity of created STP was 10 mld where as the total sewage generated was around 40-50 mld. This indicated that rest of 30-40 untreated sewage was falling into the river.
Electric Crematoria	• Though, the construction of Electric Crematoria was to be completed by March 2002 but it was actually completed by June 2002. • There was a cost overrun of ₹ 0.33 crore for which reasons could not be ascertained. • The constructed crematorium was handed over in June 2006 to Arya Samaj, Lodhi Road for operation and maintenance.
STP 3 mld FAB technology	• The STP was required to be completed by March 2002 but it was completed in December 2002 after a delay of nine months. • The project was delayed due to non getting of approval of plot plan and single line diagram, space constraint and blockage of approach road etc. • Against three mld created capacity, present utilisation of STP was around only one mld (as of November 2010) and daily sewage generation was 1.6 mld. This indicated that 0.6 mld of untreated sewage was falling into Yamuna
STP 3 mld SAFF technology	• The project was scheduled for completion by March 2002 but it was actually completed in December 2002 after a delay of nine months. • The project was delayed due to delay in clearance of site, non-approval of plot plan, delay in conducting reliability test due to insufficient & non-consistent sewage etc. • The STP treated only one mld against the designed capacity of three mld.
STP 2 mld SAFF technology	• The project was scheduled for completion by March 2002 but it was actually completed in March 2003 after a delay of 12 months. • The project was delayed due to delay in handing over of site, revision in hydraulic and structural design and additional work etc. • The plant had been shut down since 2007 and all the sewage (2 mld) was being discharged into the Yamuna through a drain/nallah without treatment.
LCS	• The project was to be completed in March 2002 but it was actually completed in February 2003 after a delay of eleven months.

	• 959 Low Cost Sanitation units were constructed under the project against the target of 1146. Out of these, only 49 *per cent* were functioning and the rest were non-functional. 60 LCS Units were encroached, 223 were lying abandoned and 33 were completely demolished. A proposal for utilizing the space where LCS Units were demolished was being considered by MCD.
2 mld Disinfection Plant at Sen Nursing Home	• The original sanctioned date of completion of the project was February 2002 but it was finally completed in March 2002. • The STP capacity created under the project was two mld but the plant is lying non functional at present.
Public Participation and Awareness	• Asian Center for Organization Research and Development (ACORD) was appointed as apex NGO for implementation of the public participation programme. No agreement was signed between MCD and ACORD for implementation of the project. MCD had not settled the accounts of ACORD due to certain discrepancies found in the utilization certificate furnished by ACORD. • The completion certificate, final utilization certificate furnished to MoEF and date on which completed were also not found.
STP 135 mld	• The project was sanctioned in June 2006 at a cost of ₹ 65.03 crore. The sanctioned date for completion of project was June 2010 but it has still not been completed. • An expenditure of ₹ 79.54 crore was incurred on the project as on March 2011, thereby cost overrun of ₹ 14.51 crore took place.
Thus, all of the projects for control of pollution of Yamuna river test checked by audit did not achieve the objectives of pollution control of Yamuna.	

10 mld STP at Delhi Gate nallah (Untreated sewage passing into yamuna)

10 mld STP at sen Nursing Home (untreated sewage flowing to yamuna)

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
No details of monitoring of the projects sanctioned under NRCP for control of pollution of Yamuna river was available for all the 10 projects.			

5.2 NLCP

No lakes from Delhi had been included for restoration and conservation under NLCP.

5.3 Ground water (in test checked six blocks)

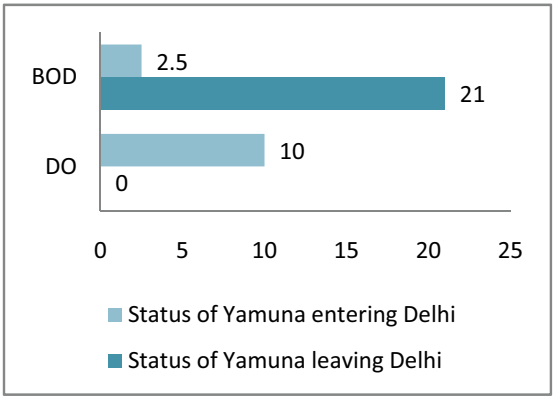
6 blocks were chosen for assessment of monitoring network with respect to ground water. These were: Gandhinagar, Model Town, Anand Parvat, Wazirpur, Defence Colony and Rajouri Garden. Anand Parvat and Wazirpur lie in the Nazafgarh drain basin which is ranked 11th in CPCB's list of crirtically polluted areas.

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Could not be verified	Could not be verified	No	No

6. Outcomes

6.1 NRCP

Status of Yamuna on entering Delhi and after leaving Delhi in terms of levels of DO and BOD is shown in the chart alongside. It can be seen that levels of BOD actually rises after Yamuna leaves Delhi highlighting the inadequate sewage treatment facilities. Further, the Dissolved Oxygen in Yamuna falls to zero after it leaves Delhi, pointing to inability of Yamuna to sustain aquatic life. As such, Yamuna is dead by the time it leaves Delhi. Levels of Total Coliform are not being measured.



State: Goa

1. Background

The major rivers of Goa are Terekhol, Chapora, Baga, Mandovi, Zuari, Sal, Saleri, Talpona, Galgibag. Some of the lakes in Goa are Mayem Lake, Carambolin Lake, Curtorim lake etc. According to Central Ground Water Board (CGWB), the annual replenishable ground water resource in Goa is 0.28 BCM and the net annual ground water availability is 0.27 BCM.

Insitutional arrangements in the State: As per information provided by MoEF, implementing agency for NRCP was Department of Science, Technology and Environment, Government of Goa.

Test checked river in Goa

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Goa is discussed below:

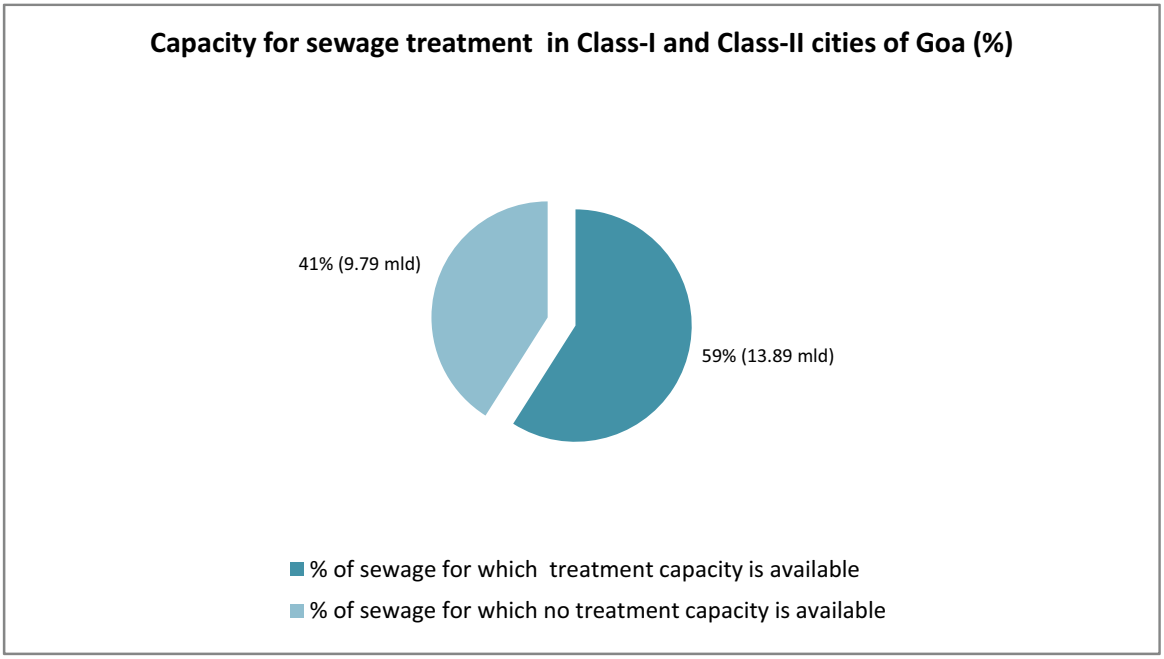
		Rivers	Lakes	Ground water
1. Inventory of water resources		Done	Could not be verified	Could not be verified
2. Assessment of water quality	**a) Chemical Indicators**	Done	Not Done	Done (arsenic, nitrate, iron, fluoride and salinity)
	b) Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Partially (done for nutrients, acidification and temperature)	Not Done	Partially (nutrients, salinity and acidification)
	d) Assessment of Impact of human activities	Partially (done for Agriculture, mining)	Not Done	Partially (Agriculture: Done, Industrial activities: Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Done	Done	No information
4. Policy for water pollution		Not Done	Not Done	Not Done

5. Programmes for prevention and control of water pollution	Partially (done only for agriculture)	Partially (done only for agriculture)	No information
6. Constitution of Water Quality Review Committee	Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Goa



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Goa is 23.68 mld, of which treatment capacity is not available for 9.79 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Mandovi river had been selected for pollution abatement projects under the National River Conservation Programme (NRCP) in only one city, Panaji. Five projects were sanctioned under NRCP at a cost of ₹ 14.10 crore. Four projects being implemented under NRCP at a cost of ₹ 14.07 crore (excluding land acquisition at a cost of ₹ three lakh) were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Mandovi/Panaji	I & D	14.10*	14.47*	July 2004	May 2005, except sewer line of 162 m which was completed in April 2009
	STP 12.50 mld				
	STP renovation and re-modeling				No information was available.
	LCS				Construction of five seater community toilets costing (₹ 3.50 lakh was not taken up as the land for this was not available and the said amount was not refunded to MoEF

* Consolidated figure for the Scheme of Environmental Upgradation Phase-I of Panaji City

(ii) Performance of the projects

The average sewage generated in the city of Panaji is 11.5 mld (actual of 2006-07) and it is entirely treated. Details of the projects test checked in Panaji which aim to improve the water quality of Mandovi river are discussed below:

Project	Findings
I&D	• The original sanctioned date for completion of the project was July 2004 but it was completed in May 2005, except sewer line of 162 meters which was completed in April 2009. • The delay was due to late issue of work order. • The number of pumping stations constructed/ commissioned was one with capacity of 0.5 mld and it was entirely utilized.
STP 12.50 mld	• The originally sanctioned date of completion of the project was July 2004 and the actual date of completion of the project was May 2005, except sewer line of 162 meters which was completed in April 2009. • The delay was due to late issue of work order. • No untreated sewage was being discharged into Mandovi.
STP renovation and re-modeling	Details of performance of project were not available.
LCS	Construction of five seater community toilets costing 3.50 lakh was not taken up as the land for this was not available and the said amount was not refunded to MoEF

4.2 NLCP

No lake in Goa has been funded under NLCP.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
In 1 out of 4 projects	0 out of 4 projects	0 out of 4 projects	0 out of 4 projects

5.2 Ground water (in test checked three Blocks)

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
No	Yes	No	Yes

6. Outcomes

6.1 NRCP

Water quality of Mandovi after Panaji

No information was available regarding levels of Dissolved Oxygen and Biochemical Oxygen Demand on Mandovi before it entered and left Panaji.

State: Gujarat

1. Background

The major rivers of central and northern Gujarat include Narmada, Sabarmati, and Mahi. Rivers flowing through the Saurashtra region are Mithi, Khari, Bhadar, Shetrunji and Bhogavo. Rivers in the southern part of the State include Narmada, Tapi, Purna, Ambika, Auranga and Damanganga. Some of the lakes in Gujarat are Kankaria, Vastrapur Lake, Chandola Lake, Gaurishankar Lake, etc. According to Central Ground Water Board, annual replenishable ground water resource in Gujarat is 15.81 BCM while the net annual ground water availability is 15.02 BCM. Out of 184 talukas, ground water in 31 talukas is over-exploited, in 12 talukas it is critical and in 69 talukas, it is semi-critical. Ground water in Gujarat is contaminated by salinity, fluoride, chloride, iron and nitrate.

Test checked river in Gujarat

Insitutional arrangements in the State: As per information provided by MoEF, Urban Development and Urban Housing Department, Government of Gujarat is the nodal department for NRCP and the implementing agency is Ahmedabad Municipal Corporation.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Gujarat is discussed below:

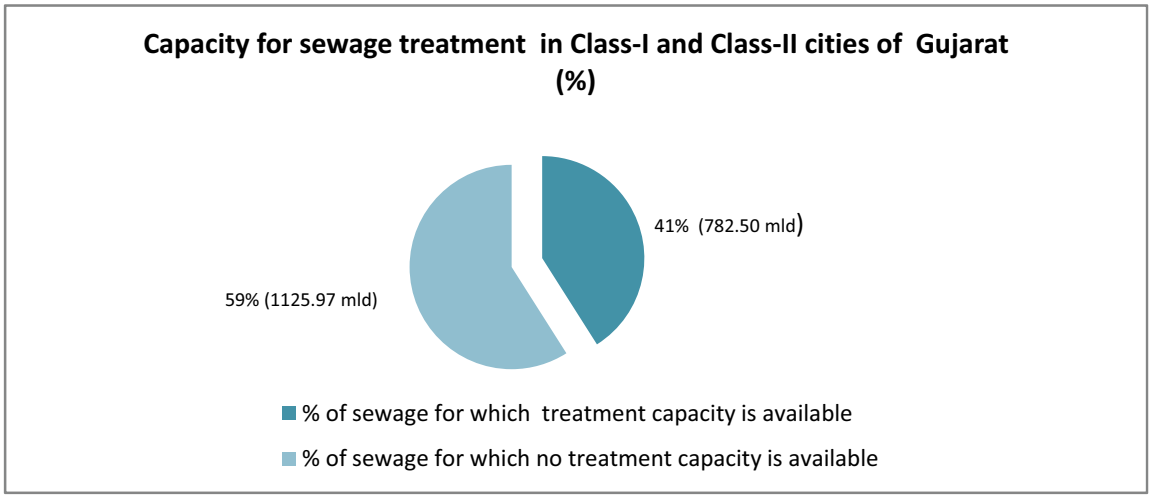
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Done	Could not be verified	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Could not be verified	Done
	b) According to Biodiversity indicators	Not done	Not done	Not applicable
	c) Quantification of contaminants	Partially	Partially (Nutrients: could not be verified, Pathogenic organism: Done, Human produced	Could not be verified

			chemicals: Not Done)	
	d) Assessment of impact of human activities	Partially (Agriculture: Not Done, Industry: Done, Mining: Not Done, Dam: Not Done, Uncontrolled disposal of human waste: Not Done)	Partially (Agriculture: Not Done, Industry: Done, Uncontrolled disposal of human waste: Not Done)	Partially (Agriculture: Not Done, Industry: Done, Uncontrolled disposal of human waste Not Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Not done	Not applicable	Not applicable
	c) Risks to human health	Not done	Not done	Not done
4. Policy for water pollution		Not done	Not done	Not done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Not verifiable, Industry: Could not be verified, Agriculture non point sources: Not done)	Partially (Source water protection: Not Done Industry: Could not be verified, Agriculture non point sources: Not Done)	Partially (Industry: Could not be verified, Agriculture non point sources: Not Done)
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Gujarat



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Gujarat is 1908.47 mld, of which treatment capacity is available for only 782.50 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Only Sabarmati river in Gujarat had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). 13 Projects were being implemented in one city i.e., Ahmedabad and the total sanctioned cost of these projects was ₹ 101.96 crore. **Nine projects costing ₹ 96.15 crore were test checked out of 13 completed projects for audit scrutiny.**

(i) Physical and financial progress

Name of the river/ location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Sabarmati, Ahmedabad	STP at Pirana	31.22	28.14	January 2003	October 2003
	STP at Vasna	34.75	31.59	November 2003	December 2004
	LCS	1.06	0.73	September 2000	September 2001
	Renovation of sewage pumping station Zone-1 &3	3.11	2.48	December 1999	Project completed but date of completion was not available
	Renovation of sewage pumping station Zone 2	4.01	2.04	December 1999	Project completed but date of completion was not available
	I&D De-silting of sewer	1.01	0.94	June 2001	Project completed but date of completion was not available
	I&D WTS Zone V Part I	1.68	1.85	October 1997	May 1998
	I&D ETS Zone IV Part I	6.40	6.30	December 1998	Project completed but date of completion was not available
	Western Trunk Sewer Zone 5 Part II	12.91	14.82	May 2001	May 2003

(ii) Performance of the projects

Ahmedabad

The average daily sewage generated in the city is 650 mld and the entire 650 mld of sewage is treated as the government has built capacity to treat 730 mld of sewage. As such, no

sewage flows directly into the Sabarmati from the city right now. **Details of some of the projects test checked in Ahmedabad city which aim to improve the quality of water in Sabarmati are discussed below:**

Project name	Findings
STP at Pirana & STP at Vasna	• These were completed in October 2003 and December 2004 respectively after a delay of nine months and one year and one month respectively. No information was available regarding submission of completion report of the project by State government to NRCD. • The installed capacity of STP at Pirana was 106 mld and that of STP at Vasna was 126 mld, both of which were being fully utilized. Regular inspections were being carried out by Gujarat Pollution Control Board and O&M of these STPs were entrusted to Ahmedabad Municipal Corporation (AMC) and preventive maintenance and cleaning was taking place of the STP.
LCS	• This was completed in September 2001 after a delay of a year. No information was available when the completion report for the project was sent by the State government to NRCD. • The project was delayed due to encroachment of site and threat by local residents. 34 LCS units were constructed under the project but only 28 were in use. The remaining six required repairing due to age of construction and tender for the same had already been invited.
Renovation of Sewage Pumping Stations Zone 1&3 and Zone 2	• These were completed but the date of completion was not available. These were working as envisaged. No information was available when the completion report for the project was sent by the State government to NRCD. • Under the project, renovation of three sewage pumping stations and seven pumping stations respectively was envisaged. However, no information was found to indicate the created capacity.
I&D De-silting of sewer, I&D WTS Zone V Part I, I&D ETS Zone IV Part I, Western Trunk Sewer Zone 5 Part II	• All these four projects were completed. However, completion date for I&D De-silting of sewer and I&D ETS Zone IV Part I were not available. • I&D WTS Zone V Part I and Western Trunk Sewer Zone 5 Part II were completed in May 1998 and May 2003 respectively after a delay of seven months and two years respectively. • All these projects were performing as envisaged.

4.2 NLCP

No lake in Gujarat has been funded under NLCP

5. Monitoring of the programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
9 out of 9 projects	0 out of 9 projects	0 out of 9 projects	0 out of 9 projects

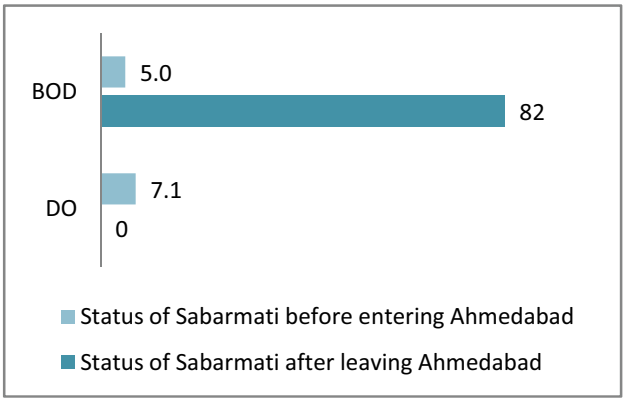
5.2 Ground water (in test checked six Blocks)

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes	Yes

6. Outcomes

6.1 NRCP

Status of Sabarmati on entering Ahmedabad and after leaving Ahmedabad in terms of DO and BOD is shown in the chart alongside. The levels of TC rise from 93 when Sabarmati enters Ahmedabad but rises alarmingly to 15,000 when Sabarmati leaves Ahmedabad showing that harmful germs like viruses, bacteria and parasites might also be found out in the water.



State: Haryana

1. Background

The main rivers that flow through the State are river Yamuna and river Ghaggar. Some of the major lakes in Haryana are Sukhna Lake, Badhkal Lake, Damdama Lake etc. According to Central Ground Water Board (CGWB), the annual replenishable ground water resources in the State are 9.31 Billion Cubic Meters (BCM), while the net annual ground water availability is 8.63 BCM. Out of 108 blocks in Haryana, 55 blocks are over-exploited, 11 blocks are critical and five blocks are semi-critical with regard to ground water development and management. Further, according to CGWB, ground water is contaminated by pollutants like fluoride, chloride, iron, nitrate and salinity.

Test checked rIver in Haryana

Insitutional arrangements in the State: As per information provided by MoEF, Public Health Engineering Department (PHED), Government of Haryana is the nodal department as well as the implementing agency for NRCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Haryana is discussed below:

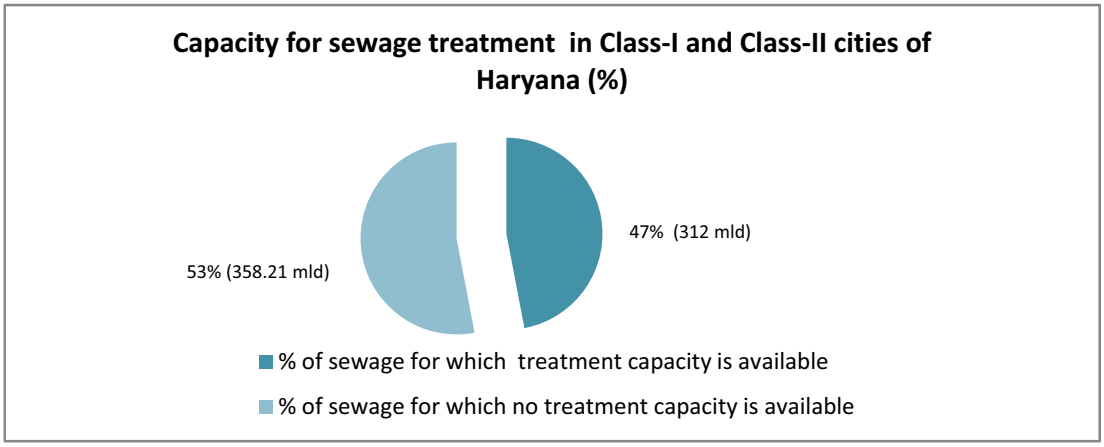
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Could not be verifid	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Partially	Could not be verified	Done (arsenic, nitrate, iron, fluoride and salinity)
	b) According to Biodiversity indicators	Could not be verified	Could not be verified	Not applicable
	c) Quantification of contaminants	Could not be verified	Could not be verified	Could not be verified
	d) Assessment of impact of human	Partially (Agriculture: Could not be verified,	Could not be verified	Partially (Agriculture:

	activities	Industry: Done, Mining: Could not be verified, Dam: Could not be verified, Uncontrolled disposal of human waste: Could not be verified)		Done, Industry: Done, Mining: Could not be verified, Uncontrolled disposal of human waste: Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Could not be verified	Not applicable	Not applicable
	c) Risks to human health	Done	Done	Could not be verified
4. Policy for water pollution		Could not be verified	Could not be verified	Could not be verified
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Could not be verified, Industry: Done, Agriculture non point sources: Could not be verified)	Could not be verified	Partially (Industry: Done, Agriculture non point sources Could not be verified)
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Gujarat



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Haryana is 670.21 mld, of which treatment capacity is available for only 312 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

In Haryana, Yamuna, the main river, had been selected for pollution abatement under the national River Conservation Programme (NRCP). Projects are being implemented in 12 towns[19] situated on the banks of river Yamuna. 127 projects in these 12 towns were sanctioned under NRCP and total sanctioned cost of all the projects was ₹ 305.63 crore.

10 projects being implemented under NRCP in the towns of Panipat and Faridabad were test checked for detailed examination. The total sanctioned cost of these projects was ₹ 24.73 crore.

(i) Physical and financial progress

Name of the river/ location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Yamuna at Faridabad	Pilot Plant at 20 mld STP Zone I	1.04	1.04	March 2002	Commissioned in March, 2002 and stabilized In March 2003.
	LCS	2.75	2.73	February 2002	November 2002
	I&D	2.76	2.76	December 2001	March 2002
	Sewer Lines Phase— II/Stage II	8.33	9.29	April, 2009	March 2009
	Public Participation and Awareness	4.10	3.56	May 2010	July 2010
Yamuna at Panipat	LCS	0.28	0.28	December 2001	March 2002
	I&D	1.43	1.44	March 2002	March 2002
	Drying Beds	0.25	0.25	December 2001	February 2002
	Sewer Lines Phase II/Stage II	1.97	1.77	February 2009	March, 2009
	Additional Sewerage Works	1.82	1.77	February 2008	March, 2009

Details of towns test checked under NRCP are discussed below:

(a) Faridabad:

Daily average sewage generated in Faridabad was 200 mld. Currently, only 115 mld capacity to treat sewage is available. The sewage actually treated is 104 mld and balance 96 mld of untreated sewage is discharged into Yamuna.

[19] Chhachhrauli, Faridabad, Gharaunda, Gohana, Gurgaon, Indri, Karnal, Palwal, Panipat, Radaur, Sonepat and Yamunanagar-Jagdri

Details of some of the projects test checked in Faridabad town are discussed below:

Project	Findings
Pilot Plant at 20 mld STP Zone I	• It was scheduled to be completed in March 2002 and commissioned in March 2002. However, it could be stabilized only in March 2003. No information was made available regarding submission of Utilisation Certificates to MoEF. • Even though the STP was to treat 20 mld of sewage, it was treating only 14 mld and the rest six mld was flowing into the river. No information was available regarding the treated sewage meeting the prescribed standards in relation to pH, Total Suspended Solids (TSS), Oil & Grease, BOD and COD.
LCS	• The LCS which consisted of 23 units started functioning in November 2002 instead of scheduled month of February 2002 after a delay of nine months. • The project was not assessed after completion and operation and maintenance of the LCS was transferred to M/s Sulabh International, a private body.

(b) Panipat:

Daily average sewage generated in Panipat is 90 mld. Currently, only 45 mld capacity to treat sewage is available and 45 mld of untreated sewage is discharged into Yamuna.

Details of some of the projects test checked in Panipat are discussed below:

Project name	Findings
I&D project at Panipat	• It was completed in March 2002. • Its cost escalated from ₹ 1.43 crore to ₹1.44 crore due to increase in length of sewer lines, increase in scope of work and increase in rates above ceiling rates. • No information was available regarding its linking to some pumping station.
LCS	• This was completed in March 2002 after a delay of three months due to shortage of material. • Three LCS units were constructed and were transferred to a private agency, M/s Sulabh international. PHED stated that they had no information whether it was functioning at present.

4.2 NLCP

No lake in Haryana was included for conservation and restoration under NLCP.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
No information for all 10 projects	No information for all 10 projects	No information for all 10 projects	No information for all 10 projects

5.2 Ground water (in test checked six Blocks)

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes (2 blocks)	Yes (4 blocks)

6. Outcomes

6.1 NRCP

(a) Water quality of Yamuna after Faridabad

Status of water quality of Yamuna entering Faridabad and after leaving Faridabad town in terms of Biochemical Oxygen Demand, Dissolved oxygen and Total Coliform were not made available to audit.

(b) Water quality of Yamuna after Panipat

No information was made available by the State government regarding status of water quality of Yamuna entering Panipat and after leaving Panipat town in terms of Biochemical Oxygen Demand, Dissolved oxygen and Total Coliform to audit.

State: Himachal Pradesh

1. Background

Some of the major rivers in Himachal Pradesh are Sutlej, Beas, Ravi, Parbati, Sukhna etc and some of the major lakes are Renuka, Rewalsar, Khajjiar, Dal, Dashir, Brighu, Prashar, Kareri, Gobind Sagar, Nako etc. The annual replenishable ground water resource in Himachal Pradesh is 0.43 BCM while the net annual ground water availability is 0.39 BCM. According to CGWB, in none of the 69 blocks is the ground water over-exploited, critical or semi-critical and the quality of ground water is generally good.

No river or lake selected under NLCP and NRCP in Himachal Pradesh

Institutional arrangements in the state: No river/lake has been selected for restoration under NRCP/NLCP in the state.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Himachal Pradesh is discussed below:

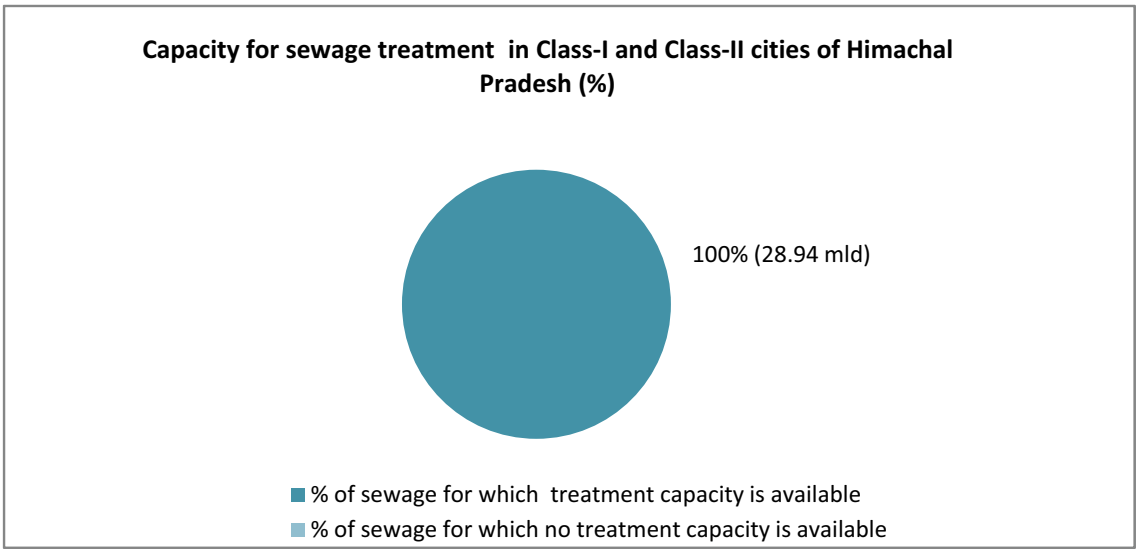
		Rivers	Lakes	Ground water
1.Inventory of water resources		Could not be verified	Not Done	Not Done
2.Assessment of water quality	**a) According to chemical Indicators**	Done	Done	Done (arsenic, nitrate, iron and fluoride
	b) According to Biodiversity indicators	Done	Done	Not applicable
	c) Quantification of contaminants	Partially (Nutrients-Done Pathogenic organism- Could not be verified, Human produced chemicals-Not Done)	Partially (Nutrients-Done. Pathogenic organism-Could not be verified. Human produced	Could not be verified

			chemicals-Not Done)	
	d) Impact of human activities	Partially (Agriculture-Not Done Industry-Done Mining-Not Done Dam-Done Uncontrolled disposal of human waste-Done)	Partially (Agriculture-Not Done. Industry-Done. Uncontrolled disposal of human waste-Done.)	Partially (Agriculture-Not Done. Industry-Done. Uncontrolled disposal of human waste-Done.)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Done	Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Not Done	Not Done	Not Done
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable :** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Himachal Pradesh



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Himachal Pradesh is 28.94 mld, of which treatment capacity is available for entire 28.94 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Even though some stretches of rivers Sukhna, Markanda and Beas were in the list of polluted rivers, they were not included under NRCP for control of pollution projects.

4.2 NLCP

It was observed that lakes like Khajjiar lake, Renuka sagar and Rewalsar lake were identified by NRCD in its list of polluted lakes, however projects for their conservation and restoration were not sanctioned under NLCP.

5. Monitoring of programmes for control of water pollution

5.1 Ground water (in test checked six blocks)

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes (except in one block)	No information for four blocks, Yes in one block, No in one block

State: Jammu and Kashmir

1. Background

The main rivers of Jammu and Kashmir are Jhelum, Chenab and Indus draining through the regions of Jammu, Kashmir and Ladakh. The largest lake in the J&K State is Pengong Tso. Wullar and Dal lakes are other important water bodies of the State. According to CGWB, the annual replenishable ground water resource in J&K is 2.70 BCM while the net annual ground water availability is 2.43 BCM. Further, in none of the districts of J&K is the groundwater over-exploited, critical or semi-critical and according to CBWB, the ground water is generally potable.

Lake test checked in Jammu and Kashmir

Insitutional arrangement in the State: As per information provided by MoEF, Housing and Urban Development is the nodal agency for implementation of NRCP. Jammu & Kashmir Lakes and Waterways Development is the implementing agency for NLCP.

2. Planning for water pollution

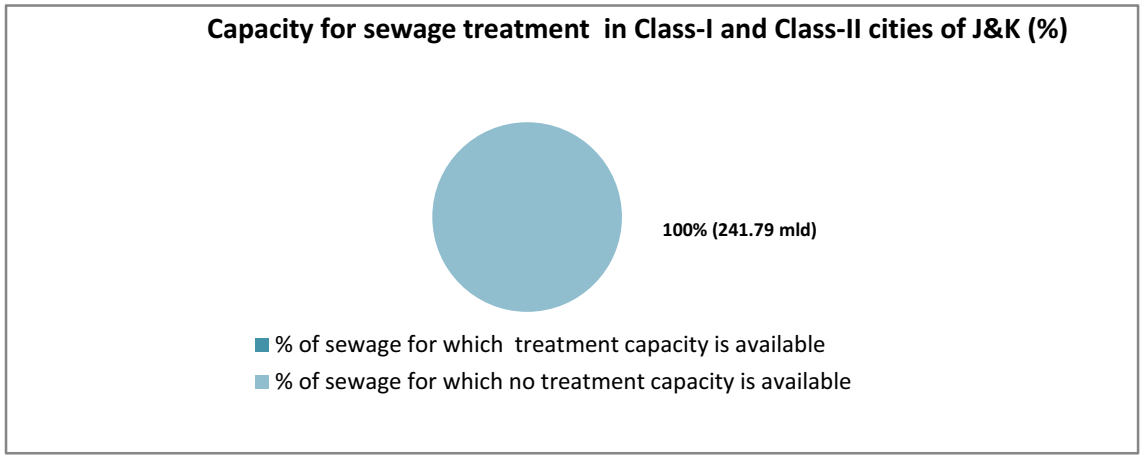
Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Jammu and Kashmir is discussed below:

		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Done	Not Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Done	Not Done (arsenic, nitrate, iron, fluoride and salinity)
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Partially	Could not be verified
	d) Assessment of impact of human activities	Not Done	Not Done	Not Done
3. Identification of risks to	**a) Risks to wetlands**	Not Done	Not Done	Not applicable

environment and health	**b) Risks to aquatic species**	Not Done	Not Done	Not applicable
	c) Risks to human health	Could not be verified	Could not be verified	Could not be verified
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Could not be verified	Partially	Not Done
6. Constitution of Water Quality Review Committee		Not Done		

[**Note: Not applicable :** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB



Sewage generated/ treatment capacity in Class I and Class II cities of J&K

[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of J&K is 241.79 mld, for which no treatment capacity is available.

4. Implementation of programmes for control of water pollution

Water Resources (Regulation and management) Act in October 2010 was passed in J&K which envisages among other things, management of works with respect to water storage, conservation and protection, irrigation, water supply, drainage, flood control and prevention; improvement in flow of water; protection and improvement in the physical integrity of water resources, lakes and springs; safety and surveillance of dams etc. It also envisaged the establishment of State Water Resources Regulatory Authority for regulating water resources, ensuring judicious, equitable and sustainable management etc. As per the Act, the Regulatory Authority within three months from the commencement of the said Act. However, the Authority had not been established till date.

4.1 NRCP

In February 1998, sanction for ₹ five lakh was accorded for survey and preparation of pre-feasibility report for "Jhelum River Action Plan". The pre-feasibility report was prepared at a cost of ₹6.28 lakh and sent to MoEF in the same year. MoEF had not released the funds upto Nov 2009 due to utilization certificate pending from J&K Lakes and Waterways Development Authority (LAWDA). LAWDA furnished the utilization certificate in Nov 2009 but funds were not transferred till date. As a result, the project did not take off and deprived the State from availing ₹17.14 crore sanctioned for the project.

4.2 NLCP

Dal is the only lake included in NLCP by MoEF and is unique in the sense that people live inside the lake in hamlets and houseboats and make their living by cultivating on floating gardens. In 1977, the State Government had launched a Project "Conservation of Dal–Nigeen Lake" for improving water quality of Dal lake and saving it from further degradation. Work on the project was started through the State Urban Environmental Engineering Department (UEED) in 1996-97 and in March 1997, the project was transferred to LAWDA.

(i) Physical and financial progress

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Dal Lake	298.76	154.18	March 2010 revised to March 2012	Ongoing

(ii) Performance of the project

Project name	Findings
Dal Lake	• The project was sanctioned by NRCD in September 2005 at a cost of ₹298.76 crore and the target date of its completion was March 2010 which has been extended upto March 2012. The Detailed Project Report (DPR) on the programme was prepared by the MoEF through Alternate Hydro Energy Centre, Roorkee (AHEC) and was approved by the MoEF at a cost of ₹1.54 crore. The project has two components viz. Lake Conservation Programme[20] funded by MoEF and Rehabilitation Programme[21] funded by State government. • **Inefficient working of STP costing ₹11.05 crore:** Six STPs at Hazratbal, Laam, Habbak, Brari Nambal, Nala Amir Khan and Hotel Welcome were projected to be constructed in a phased manner. Construction of two STPs at Brari Nambal and Nala Amir Khan was under progress and STP at Hotel Welcome was amalgamated with Brari Nambal. STP at Hazratbal and Habbak were commissioned in February 2006 and April 2006 respectively. Work on STP Laam was completed by October 2006. However, the STP did not work according to its design criteria

[20] Conservation Programme includes sewerage treatment, hydraulic works, restoration and development works, solid waste management etc.
[21] resettlement/ rehabilitation of families living in and around the lake

and concentration of nutrients increased at the outflow stage vis-à-vis inflow stage despite receiving treatment at the STPs. Further tests in 2008, 2009 and 2010 continued to reveal its inefficiency. Levels of phosphorus were also high.

The Scientific Advisory Committee of LAWDA constituted for Dal Lake also felt concerned over the presence of inorganic nutrients like Nitrate-nitrogen discharged by these STPS untreated.

In June 2009, it was decided to either to install de-nitrification units of the STPs or create artificial wet lands. No steps were taken to arrest the problem. Besides, the treated effluents also did not meet the water chemistry / parameters of the lake.

- **Non appointment of Project Management Consultant (PMC):** To ensure effective implementation of the project, a PMC was to be appointed. Despite lapse of more than five years, LAWDA has failed to appoint a PMC.

Waste floating on Dal lake

Untreated sewage on periphery of Dal lake

5. Monitoring of programmes for control of water pollution

5.1 NLCP

By Inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 1 project	0 out of 1 project	0 out of 1 project	0 out of 1 project

6. Outcomes

6.1 NRCP

No river was included under NRCP in Jammu and Kashmir.

6.2 NLCP

(a) Changes in the water quality of Dal Lake: Data reveals that there is a drastic change in the water quality which was attributed to intensified release of nutrients due to soil erosion, run-off from immediate catchment area and discharge of urban wastes including inorganic fertilizers. The increase in the values of Total dissolved solids indicated continued siltation, failure of retention of silt by partially commissioned Settling basin and high ingress of sewage into the lake and mineralization process of organic matter.

(b) Dwindling of local fish species in the lake: Notable fish species common in Dal Lake were *Schizothorax esocinus, Schizothorax niger, Schizothorax curvifons, Schizothorax. micropogon, Labeo dera, Carassius carassius.* It was observed that their number has declined sharply in the last thirty years and local species have been since outnumbered by Carpiodes. The decline in fish diversity and yield has been attributed to the changes in hydrological regime and loss of critical habitats. The changes in the species richness has also been attributed to heavy loads of incoming sewage thereby leading to increased eutrophication and impacting on the growth and development of sensitive fish species like Schizothorax. The introduction of carp and pollution of lake has resulted in alteration in the balance of local species richness.

(c) Invasion of exotic species in the lake: Azolla, the exotic species of weed is the new invader to the lake and has assumed the greater area of the lake. The same has been attributed to significant changes in the vegetational pattern of the Dal Lake and its prolific growth in the open areas is attributed to unabated inflow of effluents channels, drains, raw sewage and enrichment of the lake sediments particularly due to heavy load of organic nitrogen and phosphates.

(d) Entrapping of phosphorous and in-organic nitrogen in the lake: It has been assessed that 156.62 tonnes of phosphorus inflows into the lake from non-point/point sources out of which about 80.62 tonnes of total phosphorus leaves the lake, mainly through two outlets. This has resulted in entrapping of about 76.0 tons of total phosphorus in the lake on an annual basis. Similarly, 241.18 tonnes of inorganic nitrogen inflows into the lake from non-point/point sources out of which about 109.22 tonnes inorganic nitrogen outflow from the lake. This has resulted in entrapping of about 131.96 tons of inorganic nitrogen within the

lake system. This nutrient load has been attributed to sewage from the catchment area, agricultural practices in the catchment area, urbanization and waste discharge.

(e) Poor efficiency of settling basin: Water from catchment area / melting glaciers has to pass through settling basin before its entry into Dal Lake. The purpose of the settling basin is to retain sediments of water entering into the lake. It was, however, observed that settling basin was able to retain sediment load ranging from 53-58 *per cent*, only. This indicated poor efficiency / partial working of the settling basin. In-efficiency of the settling basin in holding the sediment load results in decrease in the depth of the lake and enrichment of its bed with the nutrient and consequently increase in the weeds etc.

State: Jharkhand

1. Background

The major rivers of State Jharkhand are Ganga, Subarnarekha, Damodar, Mayurakshi, Barakar, Koyal, Sone etc. Some of the lakes in Jharkhand are Ranchi Lake, Topchanchi lake, Hazaribagh Lake, Kanke reservoir, Getalsud reservoir, Sitarampur etc.

According to Central Ground Water Board (CGWB), the annual replenishable ground water resource in Jharkhand is 5.58 Billion Cubic Meters (BCM) and the net annual ground water available is 5.25 BCM. In none of the blocks of Jharkhand is the ground water over-exploited, critical or semi-critical. The contaminants found in ground water in Jharkhand are fluoride, iron and nitrate.

Test checked river in Jharkhand

Insitutional arrangements in the State: As per information provided by MoEF, Department of Urban Development, Government of Jharkhand was the nodal agency and the Mineral Area Development Authority (MADA) was assigned the responsibility of being the implementing agency for NRCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Jharkhand is discussed below:

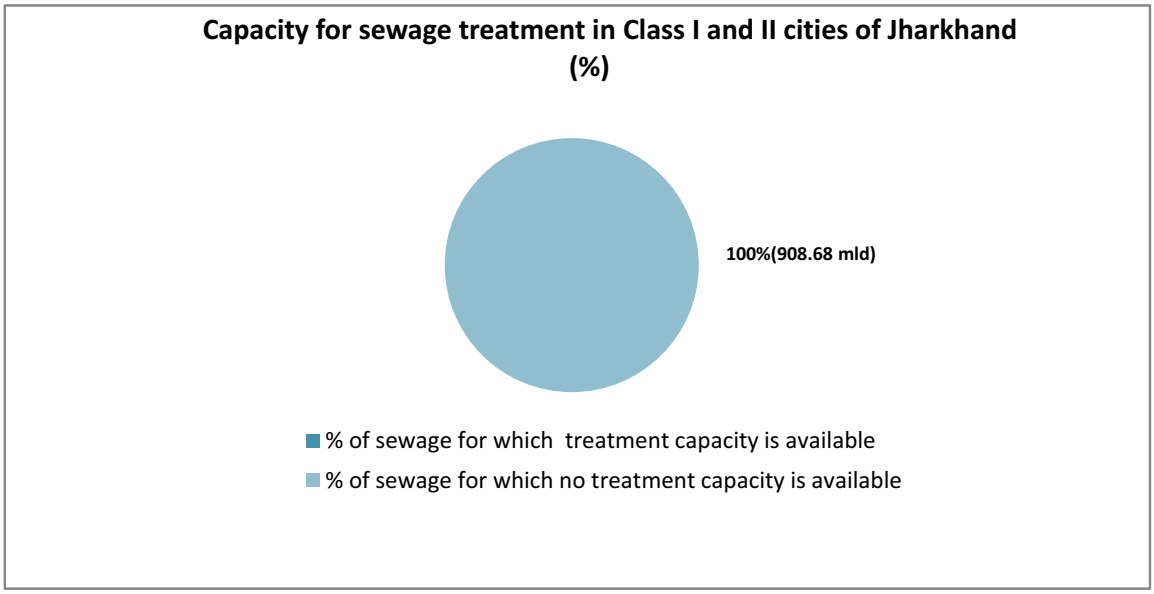
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Not Done	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Not Done	Done
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified
	d) Assessment of impact of human activities	Not Done	Not Done	Not Done
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Could not be verified	Not Done	Not applicable
	c) Risks to human health	Done	Done	Could not be verified

4. Policy for water pollution	Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution	Not Done	Not Done	Not Done
6. Constitution of Water Quality Review Committee	Not Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Jharkhand



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Jharkhand is 908.68 mld, for which no treatment capacity is available.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Ganga, Damodar and Subarnarekha rivers had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). 15 projects in 12 towns[22] were undertaken at a sanctioned cost of ₹4.38 crore.

4 projects being implemented in cities of Jamshedpur and Ranchi for control of pollution of Subarnarekha river under NRCP at a cost of ₹ 2.20 crore were test checked for detailed examination.

[22] Ghatshilla, Jamshedpur, Ranchi, Bokaro-Kargali, Chirkunda, Dugdha, Jharia, Ramgarh, Sahebganj, Sindri, Sudamdih and Telmachu

(i) Physical and financial progress

Name of the river/ location	Name of the Project	Sanctioned Cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Subarnarekha at Jamshedpur	Crematoria	0.54	Nil	September 1996	Yet to commence
	LCS	0.35	0	August 1997	Not yet completed
	RFD	0.85	0.38	May 1997	2002-03 Construction of three Ghats were not undertaken
Subarnarekha at Ranchi	RFD	0.46	0.36	July, 1997	Four out of five ghats were completed & handed over to Ranchi Municipal Corporation in October 2001

(ii) Performance of the project

a) Jamshedpur

No information received from the State regarding sewage generated and treated/discharged into river Subarnarekha. **Details of three projects test checked in Jamshedpur which aim to improve the quality of water in Subarnarekha's are discussed below:**

Project	Findings
Crematoria (Electric and wood)	• This project was scheduled to be completed by September 1996 but it was not yet commenced. The project was handed over to Parvati Ghat Samiti, Jamshedpur by the Bihar Government In March 1997 and a sum of ₹ 12.50 lakh was released to the Samiti through the Deputy Commissioner, East Singhbhum. After that no further fund was made available to the Samiti by the State government till October 2005. • The nodal department had raised doubt regarding execution of the work and sought progress report and utilization of the work and said that till receipt of the same, no further amount would be released to the Samiti.
LCS	• The project was scheduled to for completion by August 1997 but project has not yet been completed in all respect and revised date of completion, if any, could not be verified. • The reasons for delay were non-execution of boring work, failure of boring due to ash and filled soil etc. • 8 LCS were sanctioned for construction. However, work of four LCS was not taken up till date. Of four LCS taken up, only construction work has been completed but not yet functional.
RFD	• The project was scheduled to be completed by May 1997 but has not yet been completed. • 3 Ghats i.e. Baroda Ghat, River Meet Point and Mango Ghat out of proposed six ghats were completed & handed over to concerned

	local bodies between July 2002 to April 2003. It could not be ascertained whether remaining three ghats were completed or not.

(b) Ranchi

No information was available regarding sewage generated and treated/discharged into the Subarnarekha. **Details of one project test checked in Ranchi which aims to improve the quality of water in Subarnarekha river are discussed below:**

Project	Findings
RFD	• The project was to be completed in July 1997 but out of proposed five ghats, only four ghats i.e. Hatia bridge, Kachnar Toli, Near Subarnarekha bridge and at Namkum (Khijri) bridge were completed and handed over to Ranchi Municipal Corporation in October 2001. • The project was delayed due to delay in publishing NIT and award of contract.

Thus all the test checked projects for control of pollution did not completely achieve their intended objectives.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
0 out of 4 projects	0 out of 4 projects	0 out of 4 projects	0 out of 4 projects

5.2 Ground water (in test checked six Blocks)

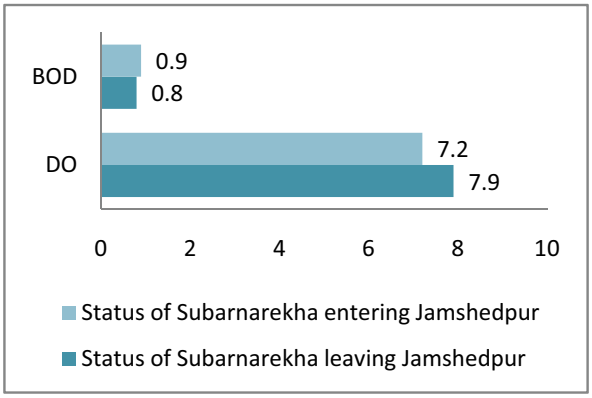
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
No for 5 out of 6 blocks	No for 5 out of 6 blocks	Yes (in concerned districts of 4 blocks)	No information

6. Outcomes

6.1 NRCP

(a) Water quality of Subarnarekha after Jamshedpur

While levels of Total Coliform were not measured, it was observed that levels of Biochemical Oxygen Demand met the criteria.



(b) Water quality of Subarnarekha after Ranchi

No information was available regarding levels of Dissolved Oxygen and Biochemical Oxygen Demand on Subarnarekha before it entered and left Ranchi.

State: Karnataka

1. Background

The river basins in Karnataka are formed by the Krishna, Cauvery, Godavari, Tungabhadra, North Pennar, South Pennar & Palar. Some of the lakes in Karnataka are Bellandur Lake, Kotekere Lake, Sharanabasaveshwara Lake, Bhishma Lake, Channapatna Lake etc. According to Central Ground Water Board, the annual replenishable ground water resource in the State is 15.93 Billion Cubic meters (BCM) and the net annual ground water availability is 15.30 BCM. Out of 175 talukas in the State, in 65 talukas, the ground water is over exploited, in three talukas it is critical and in 14 talukas it is semi-critical. The ground water in Karnataka has contaminants like salinity, fluoride, chloride, iron and nitrate.

Rivers and lakes test checked in Karnataka

Insitutional arrangements in the State: As per information provided by MoEF, Forests, Ecology and Environment Department, Government of Karnataka and Office of Chief Secretary were the nodal departments for NRCP and the implementing agencies were Karnataka Urban Water Supply and Drainage Board and Karnataka State Pollution Control Board. Lake Development Authority, Government of Karnataka is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Karnataka is discussed below:

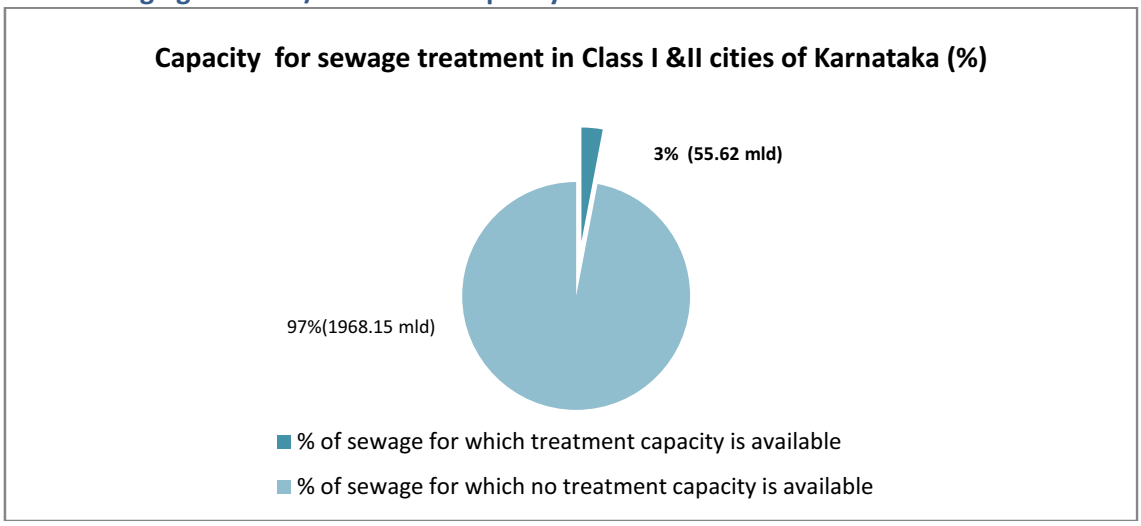
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Done	Could not be verified	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Could not be verified	Could not be verified	Done (arsenic, nitrate, iron, fluoride and salinity)
	b) According to Biodiversity indicators	Could not be verified	Could not be verified	Not applicable

	c) Quantification of contaminants	Partially (Nutrients: Could not be verified, Pathogenic organism: Done, Human produced chemicals: Done)	Partially (Nutrients: Could not be verified, Pathogenic organism: Done, Human produced chemicals: Done)	Could not be verified
	d) Assessment of impact of human activities	Not Done	Could not be verified	Could not be verified
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Not Done	Not Done	Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Could not be verified, Industry: Could not be verified, Agriculture non point sources: Done)	Could not be verified	Partially (industry: Could not be verified, Agriculture non point sources: Done)
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Karnataka



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Karnataka is 2023.77 mld, of which treatment capacity is available for only 55.62 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Rivers Bhadra, Tungabhadra, Cauvery, Tunga and Pennar had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects are being implemented in nine cities[23]. 42 projects in these nine cities were sanctioned under NRCP out of which 28 were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 66.25 crore. Three projects[24] being implemented under NRCP at a cost of ₹ 50.54 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/ location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Bhadra at Bhadravati	I&D	1.30 revised to 1.91	2.29	July 2005	Not yet complete
Tungabhadra at Davanagere	STP based on WSP	2.36	1.86	November 2001	November 2005
Pennar at Bangalore	I&D	46.27	47.20	August 2004	Not yet complete

(ii) Performance of the projects

(a) Bhadravati

The average sewage generated in the city of Bhadravati is 4.6 mld. The STP capacity available in Bhadravati to treat sewage is 5.83 mld. However, the STP is treating only 1.49 mld due to non-completion of three wet wells and as a result, 3.11 mld of untreated sewage is being discharged into the river Bhadra. **Details of the Project test checked in Bhadravati city which aim to improve the quality of water in Bhadra is discussed below:**

Project name	Findings
I&D project for Bhadra River	• The project was scheduled to be completed in July 2005 but it was still not complete. There was a delay of more than five years. • Total expenditure of ₹ 2.29 crore was incurred on the project as on September 2010. There was a cost overrun of ₹ 99 lakhs which was due to increase in scope of work, increase in tender premium and change in designs etc. • The project was delayed due to non obtaining of approval of the revised estimate by the State Government and also obtaining clearance from PWD authorities to lay the pipeline. • 6 pumping stations were created under the project but these were not energized.Out of the total sewage generated of 4.60 mld,only 1.49 mld was being treated which was due to non completion of I&D work.

[23] viz. Bhadravati, Davangere, Harihara, KR Nagar, Kollegal, Nanjangud, Shimoga, Srirangapatna and Bangalore
[24] one each on Bhadra, Tungabhadra and Pennar rivers

(b) Davanagere

The average sewage generated in the city of Davanagere is 48 mld.The STP capacity available in Davanagere city can only treat 19.45 mld but no sewage is actually treated due to non functioning of STP. As a result, the entire 48 mld of sewage generated by Davanagere city flows into the river Tungabhadra.

Details of the project test checked in Davanagere city which aim to improve the quality of water in Tungabhadra are discussed below:

Project	Findings
STP based on WSP	• The STP was built in November 2005 after a delay of more than four years. • The project was delayed due to handing over of land by City Corporation of Davanagere. • The STP was constructed to treat 19.45 mld of sewage but no sewage was actually being treated. • The STP was handed over to City Corporation, Davanagere. The Karnataka Urban Water Supply & Drainage Board was not maintaining and also not monitoring the functioning of STPs in Davanagere city.

(c) Bangalore city

Average sewage generated in the city of Bangalore is 1200 mld and STP capacity available in Bangalore city can only treat 463 mld of sewage. However, only 120 mld of sewage is actually treated and 1080 mld of sewage is not treated. Bangalore is not situated on the bank of any river and the sewage is generated in three different valleys and joins Vellanbur lake and Vrishabhavathy stream which ultimately join river Pennar and Cauvery respectively. As a result, untreated sewage of 1080 mld actually ends up polluting water of the rivers Pennar and Cauvery.

Details of the project test checked in Bangalore city which aim to improve the quality of water in Pennar are discussed below:

Project name	Findings
I&D Environment Action Plan in Bangalore city	• This comprised of rehabilitation of sewers. The project was supposed to be completed in August 2004. In January 2010, NRCD extended the project duration upto July 2010 without any revision in project cost. • There was a cost overrun of ₹ 0.93 crore which was due to increase in scope of work and cost escalation. • The project was delayed due to land problems and litigations by the contractor. • The total sewage generated in the city (1200 mld) was too huge to be intercepted and diverted for treatment out of funds under NRCP.

Thus the projects undertaken for pollution control of Bhadra in Bhadravati city were yet to be completed, while the projects envisaged for control of pollution of Tungabhadra river in Davanagere town were not working as envisaged. Further, the project sanctioned for

control of pollution of Pennar river in Bangalore was not sufficient to meet the objective of reduction of pollution in Pennar river.

Flow of untreated sewage into River Bhadra in Bhadravati

Blocked I&D at Davanagere

4.2 NLCP

(i) Physical and financial progress

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Bellandur	5.54	1.91	August 2004	Abandoned
Kotekere	5.64	5.73	March 2006	May 2009
Sharanbhasveshwara	4.89	4.21	September 2006	On going

(ii) Performance of the projects

Project name	Findings
Bellandur Lake	• The project for restoration and conservation of Bellandur lake was sanctioned in January 2003 for 18 months and was slated for completion in August 2004. • In January 2004, Lake Development Authority, Bangalore (LDA) which was implementing this project, entrusted execution of the work to a contractor for completion by January 2005, after committing that it would be responsible for stopping and diverting sewage entering into the lake. However, LDA failed to stop/ divert the inflow of sewage in the lake which promoted prolific growth of weeds in the lake. As a result, oxygenation of the lake proved inadequate and ineffective and rendered the lake non-conducive for bio-remedial treatment. • The contractor complained in April 2005 against non-stoppage of sewage inflow and 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 by suitable means and to go for arbitration regarding the contract. LDA decided to take the opinion of the Law Department and challenge the arbitral award in High Court of Karnataka. Further, LDA decided to terminate the project, till the Master Plan for sewage treatment in the catchment of Bellandur was implemented. • The unspent balance of ₹ 1.81 crore (₹ 1.25 crore Centre share and ₹ 0.56 crore of State share) was lying with the Implementing agency (since January 2005). **Thus, the project failed to achieve its objective of restoration and conservation of Bellandur Lake, despite an expenditure of ₹1. 91 crore.**
Kotekere	• 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 was March 2006 but the project was actually completed in May 2009. The delay was due to increase in scope of work of desilting the lake and heavy rains disrupting desilting of lake. • Details of activities undertaken for restoration and conservation of Kotekere lake were as follows: • Construction of I&D: three drains opened into the lake and all three were intercepted under the project. 4.80 kms of sewer lines were laid, as envisaged.

	• Programmes for strengthening of bund, lake fencing, and shoreline development had been carried out as envisaged in the approved project proposal. • Lake was desilted and deweeded as per DPR. The completion report for the project was submitted to NRCD in November 2009 and final UC was submitted in March 2010.
Sharanbhas-veshwara lake	• The lake measured 64 acres and had a depth of 2.1 meters. As such, it did not meet the criteria of depth defined by MoEF according to which the lake to be selected. • The activities to be undertaken for restoration and conservation of the lake comprised of construction of STP, interception and diversion works, low cost sanitation etc. • The originally sanctioned date of completion of the project was September 2006 but the project was still ongoing. • Details of major activities undertaken for restoration and conservation of Sharanabasaveshwara lake were as below: - Desilting and dredging: 3.34 lakh cubic meter of silt was evacuated from the lake, which was substantially higher than the quantity considered in the DPR. - I&D: A sewer line was constructed to prevent entry of sewage into the lake. • The O&M of the lake was entrusted to four private agencies.

Untreated effluents entering Bellandur Lake

Kotekere lake: Before (left) and after (right) conservation efforts

Sharanbhasveshwara lake before (left) and after (right) after conservation efforts. These photographs are a clear testimony of sincere efforts producing results and having the desired impact.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
2 out of 3 projects	0 out of 3 projects	0 out of 3 projects	0 out of 3 projects

5.2 NLCP

By Inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 3 projects	0 out of 3 projects	0 out of 3 projects	0 out of 3 projects

5.3 Ground water (in six Blocks test checked)

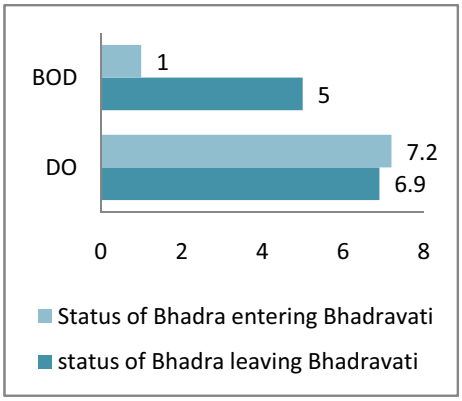
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes (5 out of 6)	Yes (5 out of 6)

6. Outcomes

6.1 NRCP

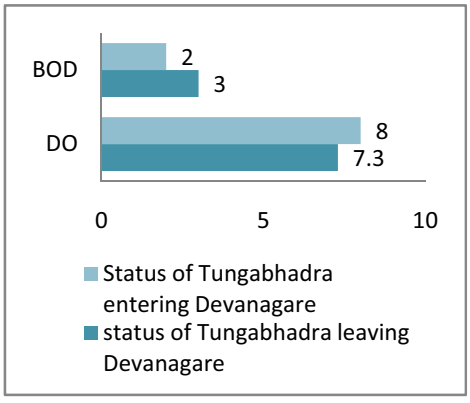
(a) Water quality of Bhadra after Bhadravati

Water quality of Bhadra on entering Bhadravati and after leaving Bhadravati in terms of DO and BOD is shown in the chart alongside. TC was 18 times the criteria, indicating the presence of disease causing fecal-related bacteria, viruses and protozoa which cause illness as the Bhadra river leaves Bhadravati.



(b) Water quality of Tungabhadra after Davanagere

Water quality of Tungabhadra on entering Davanagere and after leaving Davanagere in terms of DO and BOD is shown in the chart alongside. TC in the river rises from 700 at the time of entering Davanagere to 3000 at the time Tungabhadra leaves Davanagere and is six times the criteria, indicating the presence of disease causing, fecal-related bacteria, viruses and protozoa which cause illness.



(c) Water quality of Pennar after Bangalore

No information was available regarding status of Pennar river after Bangalore.

6.2 NLCP

Lake	Water quality status
Bellandur	Work on restoration of the lake has stopped midway.
Kotekere	It was observed that 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.
Sharanbhasveshwara	It was observed that water quality in **Sharanbhasveshwara** 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 Sharanbhasveshwara lake.

State: Kerala

1. Background

The important rivers in Kerala are Valapattanam, Chaliyar, Bharathapuzha, Periyar, Pamba. Some of the lakes in Kerala are: Veli Akkulum Lake, Ashtamudi Lake, Kuttanad Lake, Paravur Kayal, Punnamada Lake, Vembanad Lake etc According to Central Ground Water Board (CGWB), annual replenishable ground water resource in Kerala is 6.84 Billion Cubic Meters (BCM) while the net annual ground water availability is 6.23 BCM. Out of 152 blocks, ground water in five blocks is over-exploited, in 15 blocks it is critical and in 30 blocks, it is semi-critical. Ground water in Kerala is contaminated by salinity, fluoride, iron and nitrate.

Test checked rivers and lakes in Kerala

Insitutional arrangements in the State: As per information provided by MoEF, Kerala Water Authority was the nodal department for projects under NRCP but was subsequently replaced by Pamba River Basin Authority in October 2009. Travancore Devaswom Board and Irrigation Department was the nodal implementing agency. Theerapatham Urban Development Project and Tourists Resort Kerala Ltd. were the implementing agencies for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Kerala is discussed below:

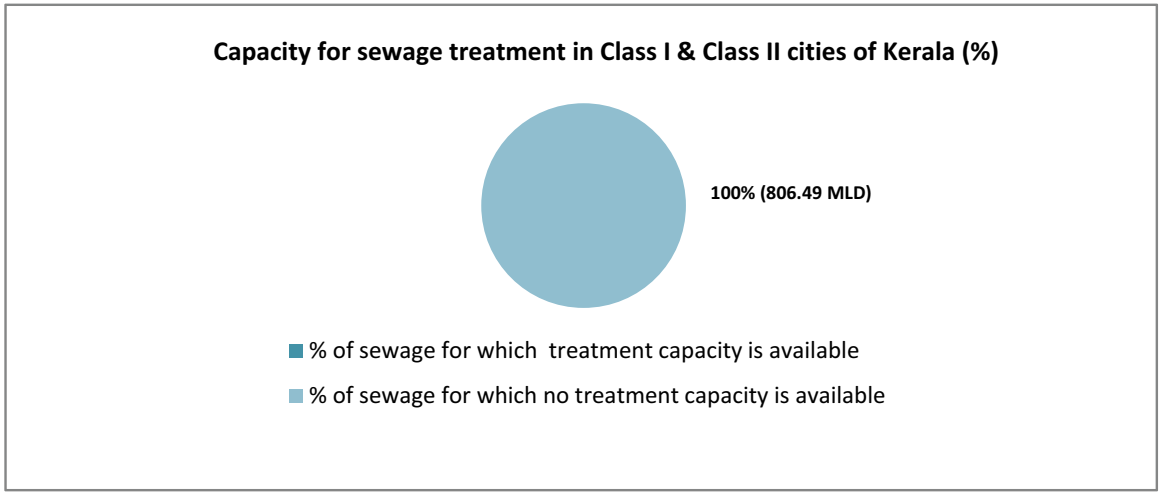
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Done	Done	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Not Done	Done
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Partially (Nutrients: Done, Pathogenic organism: Done, Human	Partially (Nutrients: Done. Pathogenic	Could not be verified

		produced chemicals: Not Done)	organism: Done. Human produced chemicals: Not Done.)	
	d) Assessment of impact of human activities	Partially (Agriculture: Not Done, Industry: Done, Mining: Not Done, Dam: Not Done, Uncontrolled disposal of human waste: Not Done)	Partially (Agriculture: Not Done. Industry: Done. Uncontrolled disposal of human waste: Not Done.)	Partially (Agriculture: Done, Industry: Not Done. Mining:Not Done. Uncontrolled disposal of human waste: Done.)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Could not be verified	Could not be verified	Not applicable
	c) Risks to human health	Done	Partially	Not Done
4. Policy for water pollution		Done	Done	Done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Could not be verified, Industry: Done, Agriculture non point sources: Done)	Partially (Source water protection: Not Done. Industry: Done. Agriculture non point sources: Done.)	Done
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Kerala



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Kerala is 806.49 mld, for which no treatment capacity is available.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Pamba river had been selected for pollution abatement projects under the NRCP. Six projects were being implemented in only Pamba city for cleaning up river Pamba of which two were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 18.45 crore.

All the six projects being implemented under NRCP at a cost of ₹ 18.45 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/ location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Pamba/ Sabarimala	LCS	4.60	1.43	May 2007	Completed
	I&D	5.60	No expenditure	May 2007	Not yet commenced
	Public participation	0.25	0.27	May 2007	Completed
	River front Development	0.43	1.39	May 2007	Completed
	STP	4.47	No expenditure	May 2007	Not yet commenced
	SWM	3.10	0.17	May 2007	Completed

(ii) Performance of the projects

Pamba and Sabarimala

The daily average sewage generated in Pamba town was seven mld and 3.5 mld of untreated sewage was being discharged into the Pamba river. The daily average sewage generated in Sabarimala was 10 mld and the entire 10 mld of untreated sewage was being discharged into the river.

Project	Findings
LCS	• Only 160 LCS were constructed at Pamba against target of 300. At Sabarimala, 320 LCS and 80 bathrooms were constructed against the target of 400 and 100 respectively. • The shortfall was due to non-availability of forest land.
I&D works	• These works were to be completed by 2007 but had not yet commenced (March 2010).
SWM	• According to MoEF inspection report of September 2010, these had been completed but no details were available.
RFD	• These were to be completed by May 2007. According to inspection by MoEF in September 2010, these had been completed but no details were available.
STP	• The project scheduled for completion by May 2007 has not commenced as yet.

- The project was delayed due to non availability of forest land and changes in design of STP as the initial draft engineering report was not based on detailed survey and investigation and this necessitated change.

Thus, projects to prevent pollution entering Pamba river have not succeeded in their objectives.

Sewage storage tank at Cheriyanavattom which over flows and sewage reaches the Njunangar stream

4.2 NLCP

(i) Physical and financial progress

Name of the lake	Sanctioned Cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Veli Akkulam lake	24.56	Not available	August 2007	Ongoing

(ii) Performance of the project

Project name	Findings
Veli Akkulam lake	• Activities to be undertaken for restoration of Veli-Akkulam lake included (i) construction of 12 mld and 13 mld STP at Ulloor and Valiathura respectively (ii) dredging including bioremediation and sewage system for Akkulam catchment (iii) site protection and beautification works • The sanctioned cost of the project was ₹ 24.56 crore and was sanctioned in August 2005 with scheduled completion date of August 2007. • The project was entrusted to the Department of Tourism, Government

of Kerala as the nodal agency and implementation was assigned to Kerala State Urban Development Project. Kerala government in January 2006 appointed Theerapadham Urban Development Project as the nodal agency and the Kerala Water Authority and Irrigation Department as implementing agencies. Theerapadham Urban Development Project was merged with Kerala Sustainable Urban Development Project.

- In May 2006 MoEF had released ₹ 4.30 crore for the project.
- In September 2009, the State government ordered that the regeneration work of the lake would be undertaken by funds allotted by the 12th Finance commission for special projects and the required funds were obtained from it and awarded to three public sector undertakings. It was also observed that in the meantime, an STP out of JNNURM funds was to be constructed for management of sewage of Thiruvananthapuram Corporation area and so the construction of STPs proposed for regeneration of Veli-Akkulam was dropped.
- A site visit by MoEF in September 2010 revealed that the de-weeding and de-silting work were under progress. MoEF also noted that Irrigation department which has been appointed as the nodal agency by the State government should regularly monitor the implementation of works.

Thus, the project for restoration and conservation of Velli-Akkulam lake had not achieved its objectives as yet.

Amayizhanjan canal carries municipal waste of Thiruvananthapuram city to Veli-Akkulam lake. A view near Kannammoola Bridge.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
0 out of 6 projects	0 out of 6 projects	0 out of 6 projects	0 out of 6 projects

5.2 NLCP

By inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 1 project	0 out of 1 project	0 out of 1 project	0 out of 1 project

6. Outcomes

6.1 NRCP

Pamba/ Pamba	While BOD and DO were not measured, TC in Pamba was 2.2 times the criteria as it leaves Pamba town indicating the presence of disease causing faecal-related bacteria, viruses and protozoa which cause illness.

6.2 NLCP

As the project on improving water quality of Veli Akkulam lake has not started, no conclusions could be drawn about impact of NLCP in restoring the lake.

State: Madhya Pradesh

1. Background

Madhya Pradesh has numerous rivers, the important ones being Narmada, Chambal, Betwa, Kshipra, Sone, Mahanadi, Khan, Indrawati, Tapti, Wain Ganga, Beehar and Mandakini. Some of the lakes in Madhya Pradesh are Tawa Reservoir, Upper Lake (Bhopal), Lower lake (chhota Talab), Kapur Talao, Moti sarovar, Ranguan lake, Shivpuri Lake, Sakhya sagar lake etc. According to Central Ground Water Board, annual replenishable ground water resource in Madhya Pradesh is 37.19 BCM while the net annual ground water availability is 35.33 BCM. Out of 459 blocks, in 24 blocks ground water is over-exploited, in five blocks it is critical and in 19 blocks, it is semi-critical. Ground water in Madhya Pradesh is contaminated by salinity, fluoride, chloride, iron and nitrate.

Test checked rivers and lakes in Madhya Pradesh

Insitutional arrangements in the State: As per information provided by MoEF, Housing and Environment Department, Government of Madhya Pradesh is the nodal department for NRCP and the implementing agencies are Madhya Pradesh Pollution Control Board, Public Health Engineering Department and Environment Planning & Coordination Organization (EPCO). Environmental Planning and Coordination Organisation is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Madhya Pradesh is discussed below:

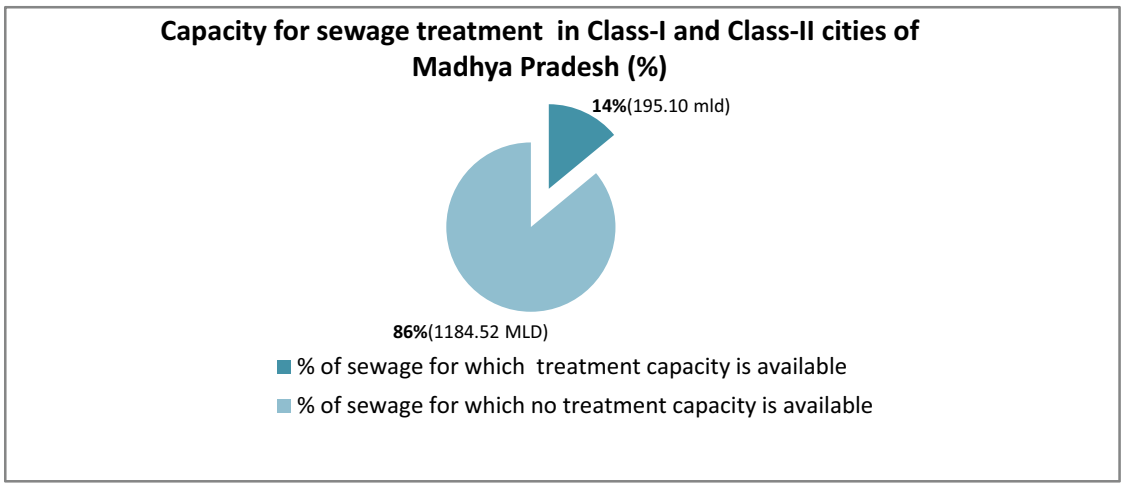
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Could not be verified	Could not be verified	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Could not be verified	Could not be verified	Done
	b) According to Biodiversity indicators	Could not be verified	Could not be verified	Not applicable
	c) Quantification of contaminants	Not Done	Not Done Could not be verified)	Could not be verified

	d) Assessment of impact of human activities	Partially (Agriculture: Could not be verified, Industry: Done, Mining: Not Done, Dam: Not Done, Uncontrolled disposal of human waste: Could not be verified)	Could not be verified	Partially (Agriculture: Could not be verified, Industry: Could not be verified, Mining: Not Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Could not be verified	Could not be verified	Not applicable
	c) Risks to human health	Done	Could not be verified	Could not be verified
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Not Done, Industry: Could not be verified, Agriculture non point sources Could not be verified)	Partially (Source water protection: Not Done. Industry: Could not be verified. Agriculture non-point sources: Could not be verified.)	Could not be verified
6. Constitution of Water Quality Review Committee		Could not be verified		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Madhya Pradesh



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Madhya Pradesh is 1379.62 mld, of which treatment capacity is available for only 195.10 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Rivers Betwa, Tapti, Wain Ganga, Khan, Narmada, Chambal, Kshipra, Beehar and Mandakini had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects were being implemented in 14 towns[25]. 69 projects in these 14 towns were sanctioned under NRCP out of which 57 were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 115.38 crore.

Eight projects being implemented in cities of Indore, Vidisha and Ujjain at a cost of ₹ 52.32 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Khan/ Indore	MPS	4.33	4.69	December 2001	February 2005
	I&D Part II	2.53	2.84	December 2001	January 2007
	STP	27.80	26.82	August 2004	April 2008
Betwa/ Vidisha	I&D	2.59	2.58	January 2000, revised to January 2006	January 2007
	STP	1.08	1.06	September 2001	January 2007
Kshipra/ Ujjain	I&D	6.41	6.40	May 2000	December 2003
	STP	2.78	2.87	July 2000	December 2003
	I&D Part II	4.80	5.06	July 2000	December 2003

(ii) Performance of the projects

(a) Indore

The average sewage generated in the city of Indore is 140 mld. However, only 90 mld is treated and the rest 50 mld is discharged into the Khan river. Details of projects test checked in Indore which aim to improve the water quality of Khan are discussed below:

Project	Findings
MPS	• The project was completed in February 2005 after a delay of three years and two months. • No information was available whether the created assets under the project were performing as envisaged.
I&D Part II	• The project was completed in January 2007 after a delay of more than five years. The completion report and final Utilization Certificate for the project were sent to MoEF in August 2007. • The project was delayed due to delay in land acquisition, funds not being received in time, delay in getting power connection from electricity Board and heavy rains. • No assessment was carried out whether the project was actually meeting

[25] viz. Bhopal, Burhanpur, Chapara, Indore, Jabalpur, Keolari, Mandideep, Nagda, Seoni, Ujjain, Vidisha, Hoshangabad, Rewa and Chitrakut.

	the objectives for which it was constructed.
STP	• The project was completed in April 2008 after a delay of three years and eight months. • STP capacity created under the project was 90 mld but it was also observed that 50 mld of untreated sewage was flowing into the river Khan. As per analysis report, the treated sewage was meeting the standards of discharge in terms of BOD. However, levels of oil & grease and COD were not measured.

(b) Vidisha

The average sewage generated in the city of Vidisha is nine mld. However, only 7.2 mld is treated and the rest 1.8 mld is discharged into the Betwa river. Details of two projects test checked in Vidisha which aim to improve the water quality of Betwa are discussed below:

Project	Findings
I&D	• The project was completed in January 2007 after a delay of seven years. • The project was delayed due to delay in tender process, delay in obtaining permission from Railway Department and non-availability of funds. • STP of nine mld capacity was sanctioned under NRCP; however, STP of 7.2 mld capacity only was created. Though 9955 meters of sewer lines were to be laid under the project, only 6490 meters was actually laid.
STP	• This was competed after a delay of five years and four months due to delay in tender process and non-availability of power. • STP capacity sanctioned for Vidisha was of nine mld whereas STP of only 7.2 mld was created.The entire fund for the STP was utilized for creating STP of 7.2 mld. Therefore STP of 1.8 mld could not be created.The treated sewage was being disposed according to Karnal Technology which involves growing trees on ridges and disposing the sewage in furrows. • Though Madhya Pradesh State Pollution Control Board stated that inspections of the STP were conducted regularly, copies of the inspection reports were not made available. As such, actual performance of the STP could not be verified.

(c) Ujjain

The average sewage generated in the city of Ujjain is 57 mld. STP capacity in the city is 52.74 mld and sewage actually being treated is 47.74 mld. As such 9.26 mld of sewage is flowing untreated into the river Kshipra. Details of three projects test checked in Ujjain which aim to improve the water quality of Kshipra are discussed below:

Project	Findings
I&D	• The project was completed in December 2003 after a delay of three years and seven months. The final UC was submitted in 2006 though the project was completed in 2003. • The project was delayed due to delay in obtaining sanction from the local bodies for carrying out certain works such as road cutting, shifting of electrical line etc. • The total length of sewers to be laid under the project was 2199 meters, however, only 1256.50 meters of sewer were actually laid. Five drains were intercepted under this project and two pumping stations were also constructed. • Due to shortage of electricity, manpower and lack of funds, the I&D works were not performing as envisaged. Further, O&M was being carried out by untrained labourers on daily wages though the PHED had written letters to the Government for providing funds for proper O&M of the assets.
STP	• The project was completed in December 2003 after a delay of three years and five months. • The project was delayed due to the fact that part of the land on which the gravity sewer was to be laid had gone into litigation therefore work was delayed till the decision of court.Delay also occurred due to legal formalities and getting due sanction from local bodies for carrying out certain work such as road cutting, shifting of electrical line etc. • It was observed that proper operation and maintenance of the assets was not being carried out due to lack of funds and deficiency of trained staff. Out of 27 sewage pumps installed in Phase-I and Phase-II of NRCP, 12 pumps were not in working condition as of December 2010.Even though 52.74 mld STP capacity was created, it was noticed that only 47.74 mld was being treated and five mld was being discharged into Kshipra. The treated sewage also did not meet prescribed limits and BOD and COD were above acceptable limits. **Thus, the STP was not meeting the envisaged objectives and did not serve to improve the water quality of Kshipra.**
I&D Part II	• The project was completed in December 2003 after a delay of three years and five months. The completion certificate was sent to MoEF only in 2004 and final UC was sent only in 2006. • The project was delayed due to delays in land acquisition and delay in obtaining sanction from local bodies for carrying out certain work such as road cutting, shifting of electrical line etc. • 3865 meters of sewer lines were to be laid, only 2531 meters were laid. Three pumping stations were also planned but actual capacity created was not available.It was observed that shortage of electricity, manpower and lack of funds were hampering its full utilisation and performance. **As such, performance of the I&D project did not meet its envisaged objectives.**

Sewage overflowing (after interception) and discharging directly into river Kshipra

Sewage accumulation due to waste stablisation pond not being cleaned in for STP, Kshipra River, Ujjain

4.2 NLCP

(a) Planning for NLCP

Audit test checked Shivpuri lake for scrutiny as it had the highest sanctioned cost among the four lakes[26] selected under NLCP.

(i) Physical and financial progress

Name of the lake	Sanctioned Cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Shivpuri lake	51.99	1.79	August 2009	On-going

(ii) Performance of the project

Project name	Findings
Shivpuri lake	• Work on the project which involved activities like de-weeding, de-silting, storm water drains, LCS, bathing ghats, lake front development, public participation, etc. • The project was scheduled to be completed in August 2009 but it was still incomplete. • An expenditure of ₹25.43 lakh was incurred for advertisement of tender notices in the newspapers but subsequently three components of the project (1) Sewerage Network (2) Sewage Pumping Station (3) STP were transferred to PHED, Shivpuri in September 2009. No fund for the implementation of the project has yet been released to PHED, Shivpuri. • Information regarding submission of regular progress reports by implementing agency was unavailable and progress of the project was not being assessed periodically by the State government also. **Thus, project for restoration and conservation of Shivpuri lake has not yet been completed, though scheduled for completion in August 2009.**

5. Monitoring of programmes for control of water

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
8 out of 8 projects	8 out of 8 projects	8 out of 8 projects	8 out of 8 projects

5.2 NLCP

By inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
1 out of 1 project	1 out of 1 project	1 out of 1 project	1 out of 1 project

[26] Rani Talab, Sagar, Shivpuri and Chandpatha.

5.3 Ground water (for six blocks test checked)

6 blocks were test checked for assessment of monitoring network with respect to ground water. These were: Indore, Pithampur (industrial cluster), Jabalpur (industrial cluster), Ratlam (fluoride), Khargone (fluoride) and Jhabua (fluoride).

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes	Yes, in 6 blocks

6. Outcomes

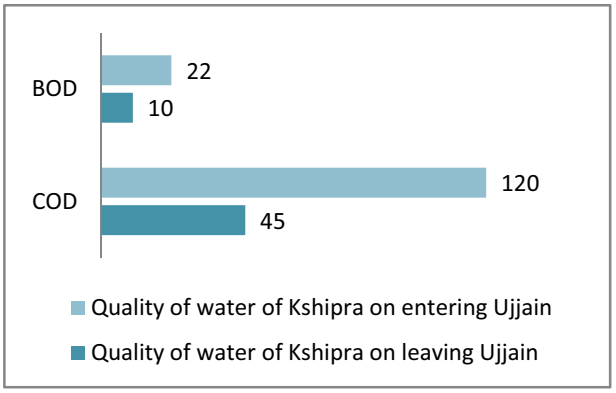
6.1 NRCP

(a) Betwa after leaving Vidisha

No analysis had been carried out by Public Health Engineering Department, Vidisha to test the quality of Betwa on entering Vidisha and after leaving Vidisha in terms of DO, BOD and TC. As such, there is no way to assess whether the projects undertaken for restoration of the Betwa were actually working.

(b) Kshipra after leaving Ujjain

With regard to water quality of river Kshipra, levels of DO and TC were not being measured and quality in terms of BOD and COD is depicted in the graph alongside. This shows an improvement in the status of water quality of Kshipra after it leaves Ujjain. However, in the absence of other indicators like TC and DO, no real conclusions regarding the quality of water in Kshipra can be derived.



6.2 NLCP

Activities relating to restoration and conservation of Shivpuri lake were not complete, as such no conclusion about outcomes could be reached.

State: Maharashtra

1. Background

The major rivers of Maharashtra are Godavari, Krishna, Tapti and Narmada. Some of the lakes in Maharashtra are Lonar Lake, Tulsi Lake, Powai Lake, Tansa Lake, Upwan Rankala Lake etc. According to Central Ground Water Board (CGWB), annual replenishable ground water resource in Maharashtra is 32.96 Billion Cubic Meters (BCM) while the net annual ground water availability is 31.21 BCM. Out of 231 talukas, in seven talukas ground water is over-exploited, in one taluka it is critical and in 23 talukas it is semi-critical. Contaminants like salinity, fluoride, iron and nitrate are present in some of the districts of Maharashtra.

Test checked rivers and lakes in Maharashtra

Insitutional arrangements in the State: As per information provided by MoEF, the Environment Department, Government of Maharashtra was the nodal department for NRCP and the implementing agencies were Maharashtra Jeevan Pradhikaran and Nashik Municipal Corporation, Maharashtra. Department of Environment, Government of Maharashtra and Kolhapur Municipal Corporation are the implementing agencies for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Maharashtra is discussed below:

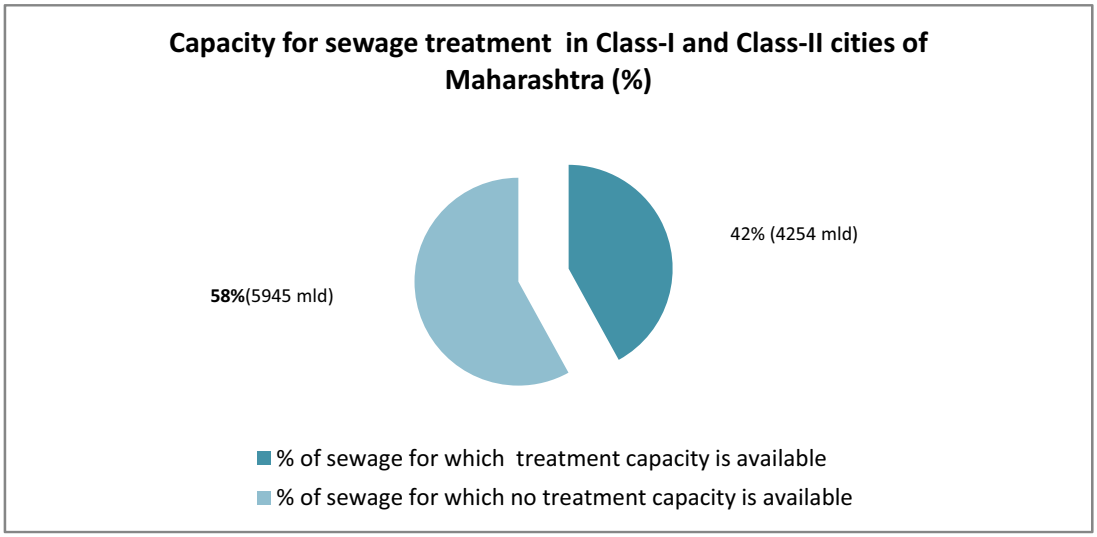
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Done	Not Done	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Not Done	Not Done	Done (arsenic, nitrate, iron, fluoride and salinity)
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable

	c) Quantification of contaminants	Partially (Nutrients: Done, Pathogenic organism: Done, Human produced chemicals: Not Done)	Not Done	Could not be verified
	d) Assessment of impact of human activities	Partially (Agriculture: Not Done, Industry: Not Done, Mining: Not Done, Dam: Not Done, Uncontrolled disposal of human waste: Done)	Not Done	Not Done
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Not Done	Not Done	Not Done
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Maharashtra



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Maharashtra is 10199 mld, of which treatment capacity is available for only 4254 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Krishna, Godavari and Tapi rivers had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects were being implemented in seven cities[27]. 31 projects in these seven towns were sanctioned under NRCP and the total sanctioned cost of all the projects was ₹ 192.60 crore. **Nine projects [28] being implemented under NRCP at a cost of ₹ 100.74 crore were test checked for detailed examination.**

(i) Physical and financial progress

Name of the river/location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Sechduled date of completion	Actual date of completion
Krishna/ Karad	STP	0.55	0.86	June 2002	December 2006
	I&D	2.64	2.28	June 2002	December 2006
Godavari/ Nashik	I&D	31.46	29.69	March 2003	July 2006
	STP 78 mld at Tapovan	20.82	20.90	March 2003	April 2004
	STP 22 mld at Chehdi	7.00	6.99	March 2003	June 2007
Krishna/ Sangli	I & D	21.06	18.91	March 2007	Not completed
	STP	2.96 revised to 4.49	4.23	August 2004 revised to October 2006	Not completed
Godavari/ Nanded	STP	2.52 revised to 2.77	2.44	March 2000 revised to June 2005	Commissioned-June 2006
	I&D	6.50 revised to 9.95	9.92	March 2000 revised to June 2005	Commissioned-June 2006

ii) Performance of the projects

(a) Karad

The daily average estimated sewage generated in the city of Karad is 7.5 mld and STP capacity of 7.5 mld is available in the city. As such, the entire daily average sewage is treated and no untreated sewage is discharged into the Krishna river. **Details of four projects test checked in Karad which aim to improve the quality of water in Krishna are discussed below:**

Project	Findings
STP	• The project was completed in December 2006 after a delay of four years and six months. • The project was delayed due to change in the type of work. • SPCB regularly monitored the performance of the STP and the treated effluents from the STP met the standards prescribed by NRCD.
I&D	• The project was completed in December 2006 after a delay of four years and six months.

[27] Karad, Nashik, Nanded, Trimbakeshwar, Prakkasha, Kolhapur and Sangli on rivers Krishna, Godavari, Tapi and Panchganga

[28] Five projects on Godavari river and four projects on Krishna river

	• The project was delayed due to change in the type of work. • 4330 meters sewer lines were laid under the project. Further, four pumping stations of 173 LPS capacity were installed under the project. There was no information available to verify the capacity at which those pumping stations were being utilized. The performance of the work was not assessed after completion of the project.

(b) Nashik

The daily average estimated sewage generated in the city of Nashik is 250 mld and 130-140 mld of sewage is treated and the rest of the 110-120 mld untreated sewage is discharged into the River Godavari. **Details of four projects test checked in Nashik which aim to improve the quality of water in Godavari are discussed below:**

Project	Findings
I&D	• The project was completed in July 2006 after a delay of three years and four months. • The project was delayed due to delay in completion of some minor works of Takli Pumping Station. The project completion reports along with final utilization certificate were yet to be submitted to NRCD.
STP at Tapovan	• The project was completed in April 2004 after a delay of one year and one month. The project completion report along with the utilization certificate was yet to be submitted to NRCD. • The State government had not taken mandatory consent from SPCB for installation of STP.
STP at Chehdi	• The project was completed in June 2007 after a delay of four years and three months. • The project was delayed due to non-acquisition of land, change in designand increase in span of rainy seasons etc. • The STP did not perform full treatment capacity due to non-pumping of adequate quantity of sewage and the STP treated only 15 mld sewage. The rest of the seven mld of sewage remained untreated and was being discharged into Godavari river.

(c) Sangli

The daily average estimated sewage generated in the city of Sangli is 26.47 mld and STP capacity available in the city was adequate to treat 13 mld of sewage. However, no sewage was actually being treated and the entire 26.47 mld of untreated sewage was being discharged into River Krishna. **Details of four projects test checked in Sangli which aim to improve the quality of water in Krishna are discussed below:**

Project	Findings
I&D	• The project was scheduled for completion by March 2007.Only 54 per cent of works have been completed as of March 2010 defeating the purpose for which the project was sanctioned. • The project was delayed due to litigation.
STP	• The project was scheduled for completion by August 2004, it was still in progress as of March 2011. No reasons for the delay were available in files.

	• Even after time overrun of more than six years, only 70 per cent of work was completed. **Thus, the entire untreated sewage of Sangli city was being discharged into the river Krishna, defeating the purpose for which the project was sanctioned.**

(d) Nanded

The daily average sewage generated in the city of Nanded is 60 mld and no STP is available in the city. As such, the entire untreated sewage is discharged into the Godavari river. **Details of two projects test checked in Nanded which aim to improve the quality of water in Godavari are discussed below:**

Project	Findings
STP	• The project was completed and commissioned in June 2006 after a delay of six years and three months. • The project was delayed due to land litigation, rainy season and shifting of High Tension power line of Maharashtra State Electricity Board etc. • Entire structure of STP including stabilisation pond, inlet outlet arrangement and canal work were demolished and dismantled by NWMC and work for a new STP of 87 mld proposed under JNNURM was in progress on at the same site. Thus, the entire expenditure of ₹ 2.44 crore incurred on 26 mld STP under NRCP was rendered unfruitful besides non-achieving of desired benefits and water pollution abatement objectives of the scheme. • Avoidable expenditure of ₹ 54.52 lakh was incurred by MJP on watch and ward arrangement on the non-functional STP during June 2006 to December 2010.
I&D	• The project was commissioned in June 2006 after a delay of six years and three months. The completion report was not submitted to NRCD. • The project was delayed due to land litigation, heavy rains etc. • All the 19 drains trapped under NRCP were trapped near the bank of Godavari River well below High Flood Line by way of intercepting sewer line lying adjacent and parallel to the river bank in the backwaters zone; the same remained submerged during high flow. Thus, a polluting nerve in the form of intercepting sewer was created just adjacent to river whose pollution was to be abated. The whole intercepting sewer was submerged in rainy season, increasing the chances of mixing of sewage with river water. • During joint inspection in January 2011, it was found that pumping station and machinery created under the project at a cost of ₹ 1.60 crore were lying in a very neglected condition and the mobile generator set, electrical panel were found in damaged condition. The building glass and electrical fitting were also found in damaged condition. Some parts/spares were stolen from the pumping station.

Untreated sewage from STP in Karad flowing into Krishna

Abandoned works in Sangli

4.2 NLCP

Works relating to restoration and conservation of two lakes, i.e., Powai lake and Rankala lake were selected for detailed examination.

(i) Physical and financial progress

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Powai	6.62	4.32	April 2003	April 2003
Rankala	8.65	2.39	January, 2009	Work in progress

(ii) Performance of the projects

Project name	Findings
Powai	• 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 sanctioned in June 2001 at an estimated cost of ₹ 6.62 crore with a scheduled date of completion by April, 2003 and was completed in time after incurring the expenditure of ₹ 4.32 crore. The project completion report along with final utilization certificate were yet to be submitted by Municipal Corporation of Greater Mumbai (MCGM) to NRCD. The project was also declared completed by NRCD. However, documents disclosed that the final payment of the contractor was yet to be paid which indicated that the project was still ongoing. • Unspent balance of ₹ 93.84 lakh was retained by Municipal Corporation of Greater Mumbai (MCGM).
Rankala	• In October, 2006, NRCD sanctioned a project to Kolhapur Municipal Corporation at an estimated cost of ₹ 8.65 crore with a scheduled date of completion by January 2009. Even though the sanction period of the project had expired in January 2009, the project was still continuing without any extension. • NRCD released ₹ 2.50 crore to the implementing agency, an expenditure of ₹ 2.39 crore was incurred on the project as of March 2010.

Thus, the project to restore and conserve Rankala lake did not meet its objectives.

Proliferation of weeds in Powai lake

Polluted shoreline of Powai Lake

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
0 out of 9 projects	0 out of 9 projects	0 out of 9 projects	0 out of 9 projects

5.2 NLCP

By inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 2 projects	1 out of 2 projects	2 out of 2 projects	0 out of 2 projects

5.3 Ground water (for six blocks test checked)

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes, in 5 blocks	Yes, in 5 blocks	Yes	Yes, in 4 blocks

6. Outcomes

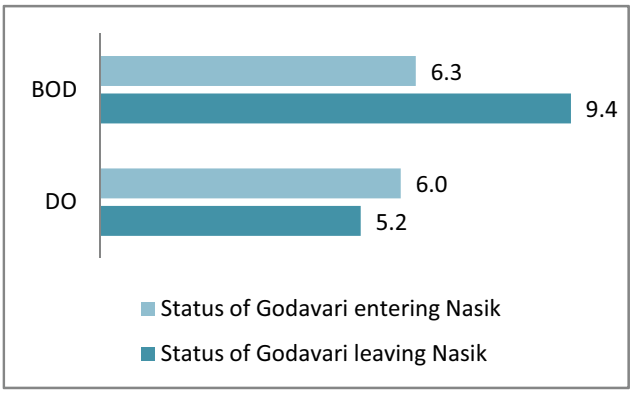
6.1 NRCP

(a) Water quality of Krishna after Karad

The daily average estimated sewage generated in the city of Karad is 7.5 mld and STP capacity of 7.5 mld is available in the city. As such, the entire daily average sewage is treated and no untreated sewage is discharged into the Krishna river.

(b) Water quality of Krishna after Sangli

The Dissolved oxygen (DO), Bio chemical Oxygen demand (BOD) and Total coli form (TC) of Krishna when it enters Sangli city and after lit leaves Sangli city had not been measured. As such, no indicators existed for arriving at any conclusions regarding quality of water in Krishna.

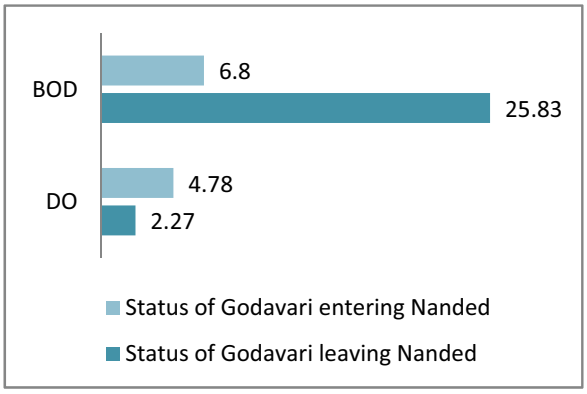


(c) Water quality of Godavari after Nashik

The status of Godavari river entering and leaving Nashik in terms of DO and BOD is shown in the chart opposite. TC at the time of river entering and leaving the town was 22.7 and 38.3 respectively. It can be seen that BOD rises by 49 *per cent* and TC increased by 68 *per cent* after Godavari leaves Nashik. This indicated that system of sewage treatment was inadequate.

(d) Water quality of Godavari after Nanded

Dissolved oxygen (DO) and Bio chemical Oxygen demand (BOD) of Godavari river when it enters Nanded city was 4.78 and 6.8 respectively and after the river Godavari leaves Nanded city, DO and BOD was measured as 2.27 and 25.83 respectively indicating worsening position. However, the TC had not been measured at the time of the river either entering or leaving the town.



6.2 NLCP

As the project on improving water quality of Rankala is still in progress, no conclusions could be drawn about impact of NLCP in restoring the lake. Powai lake water quality was not being monitored by Central Pollution Control Board.

State: Nagaland

1. Background

The main rivers flowing through Nagaland are Dhansiri, Doyang, Dikhu and Jhanji. Nagaland has lakes likes Shilloi which is the largest natural lake in Nagaland. There is also a landslide lake, Twin lake, Dzudu and Oxbow lakes. The annual replenishable ground water resource is 0.36 BCM while the net annual ground water availability is 0.32 BCM. According to CGWB, the status of ground water in Nagaland is generally good.

Test checked lakes in Nagaland

Insitutional arrangements in the State: As per information provided by MoEF, the Department of Public Health & Engineering, Government of Nagaland was the nodal department for NRCP. Department of Public Health & Engineering, Government of Nagaland is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Nagaland is discussed below:

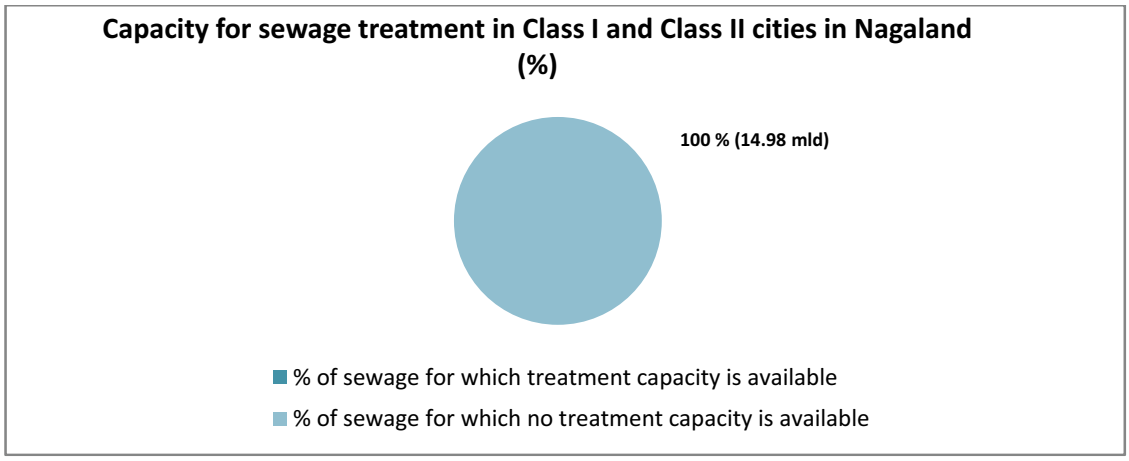
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Could not be verified	Could not be verified	Not Done
2. Assessment of water quality	**a) According to chemical Indicators**	Not Done	Not Done	Not Done
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified
	d) Assessment of impact of human activities	Not Done	Not Done	Not Done
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Could not be verified	Could not be verified	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done

5. Programmes for prevention and control of water pollution	Not Done	Not Done	Not Done
6. Constitution of Water Quality Review Committee	Not Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Nagaland



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Nagaland is 14.98 mld, for which no treatment capacity is available.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Even though Diphu has been selected for cleaning up under NRCP, it was observed that this river did not figure in the list of polluted rivers prepared by CPCB and this was not critically polluted. As such, taking up this river under NRCP was not justified.

4.2 NLCP

(i) Physical and financial progress

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Twin lake (Amok Lushi and Yimdong Awatsung)	25.83	6.46	October 2011	Not completed

(iii) Performance of the project

Project name	Findings
Twin lake (Amok Lushi and Yimdong Awatsung)	• The selection of Twin lakes under NLCP did not meet the selection criteria set out by MoEF with respect to physical parameters. It was observed that Amok Lushi and Yimdong Awatsung were only 1.85 acres and 0.85 acres respectively. Further, their depth was only 1.65 meters and 1.8 meters respectively. As such, they did not qualify for selection under NLCP. Further, according to MoEF, scientific criteria like discharge of industrial and domestic waste water into the lake and degradation of quality of lake water should be used to select a lake. It was observed that no such data on scientific criteria was available with Nagaland, yet the twin lakes were selected under NLCP. There was no discharge of any domestic, industrial or municipal waste water into the lakes. As such, the selection of the lakes under NLCP was not justified. • 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 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 was scheduled to be completed in October 2011. The Central Share of ₹ 5.81 crore and the State share of ₹ 0.65 crore were released in October 2009 and March 2010 respectively. • The Nagaland Government could incur an expenditure of ₹6.46 crore upto March 2011.

Lake Omuklushi

5. Monitoring of programmes for control of water pollution

5.1 NLCP

By inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 1 project	0 out of 1 project	0 out of 1 project	0 out of 1 project

6. Outcomes

6.1 NLCP

Since the programme to restore and clean up the Twin Lake was still ongoing, no conclusions can be drawn about its impact on improving the quality of water.

State: Odisha

1. Background

Mahanadi, Subarnarekha and Brahmani are the major rivers of Odisha. Some of the lakes in Odisha are Chillika Lake, Bindusagar Lake etc. According to Central Ground Water Board, the annual replenishable ground water resource in the State is 23.09 BCM and the net annual ground water availability is 21.01 BCM. Out of the 314 blocks in the State, in none of them is the ground water over-exploited, critical or semi-critical. Some of the contaminants affecting ground water in Odisha are fluoride, iron and nitrate.

Test checked rivers and lakes in Odisha

Insitutional arrangements in the State: As per information provided by MoEF, Housing & Urban Development Department, Government of Odisha is the nodal department for NRCP and the implementing agency is Odisha Water Supply and Sewerage Board. Bhubaneswar Municipal Corporation (BMC) is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Odisha is discussed below:

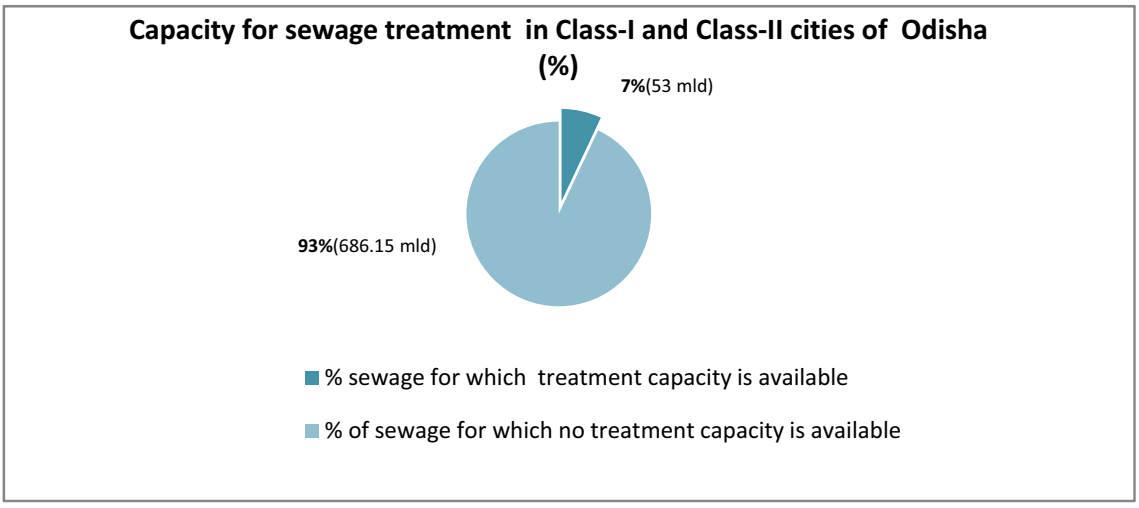
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Could not be verified	Could not be verified	Could not be verified
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Done	Could not be verified
	b) According to Biodiversity indicators	Could not be verified	Could not be verified	Not applicable
	c) Quantification of contaminants	Partially (Nutrients: Done, Pathogenic organism: Could not be verified, Human produced chemicals: Done)	Partially (Nutrients: Done, Pathogenic organism: Could not be verified, Human produced chemicals: Could not be verified)	Could not be verified

	d) Assessment of impact of human activities	Partially (Agriculture: Done, Industry: Done, Mining: Done, Dam: Could not be verified, Uncontrolled disposal of human waste: Done)	Not Done	Could not be verified
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Could not be verified	Could not be verified	Not applicable
	c) Risks to human health	Done	Partially	Could not be verified
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Could not be verified	Could not be verified	Could not be verified
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Odisha



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Odisha is 739.15 mld, of which treatment capacity is available for only 53 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Brahmani and Mahanadi rivers and the coastal area of Puri had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects were being implemented in five cities viz. Chandbali, Cuttack, Dharamshala, Talcher and Puri on rivers Brahmani and Mahanadi and Puri coastal area. 22 projects in these five cities were sanctioned under NRCP out of which 13 were completed as of March 2010. The total

sanctioned cost of all the projects was ₹ 92.74 crore. **Seven projects being implemented under NRCP at a cost of ₹ 81.01 crore were test checked for detailed examination.**

(i) Physical and financial progress

Name of the river/location	Name of the project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Mahanadi/ Cuttack	I&D Part II	1.20	1.40	September 2005	September 2008
	STP, Matagajpur	3.51	3.65	March 2003	August 2006
	I&D Part I	3.20	2.46	March 2003	September 2008
	LCS	0.13	0.18	March 2001	December 2002
Coastal area/ Puri	I&D	51.80	Consolidated expenditure of 48.66 (as on January, 2010) for the Project titled 'Sewage collection and Treatment System for Puri Town in Odisha'	March 2006 (Original), March 2009 (Revised)	The project is not completed as a whole
	MPS	9.95			
	STP	11.22			

(ii) Performance of the projects

(a) Cuttack

The daily average sewage generated in the city of Cuttack is estimated to be 80 mld. However, only 37.5 mld is treated and the rest 42.5 mld is discharged into the Mahanadi. **Details of the projects test checked for improving water quality of Mahanadi river are discussed below:**

Project name	Findings
I&D Part II	• The project was completed in September 2008 after a delay of three years. Information regarding submission of completion report and final UC to MoEF was not available. • The project was delayed due to interference by public as a result of which the contractor could not complete the work in time. • No infrastructural problem was hampering its performance. The responsibility for O&M of the created asset was allocated to Cuttack Municipal Corporation.
STP, Matagajpur	• The project was completed in August 2006 after a delay of three years and five months due to which the project cost escalated by almost ₹ 14 lakh. • The project was delayed due to change in design of the STP. • The STP capacity was being fully utilised.

I&D Part I	• The project was completed in September 2008 after a delay of five years and six months. Further, information regarding submission of completion report and final UC to MoEF was not available. • The project was delayed due to interference by public as a result of which the contractor could not complete the work in time. • Against the target of 2435 meters of sewer lines to be laid under the project, only 2264 meters were laid. • Even though the project had been completed by 2008, it was yet to be taken over by Cuttack Municipal Corporation which was the agency designated for its operation and maintenance.
LCS	• The project was completed in December 2002 after a delay of one year and nine months • The project was delayed due to delay in handing over site, labour problems and non-availability of material in rainy season. • No infrastructural problem was hindering the operation of the LCS.

(b) Puri

The daily average sewage generated in the city of Puri is estimated to be 28 mld. However, only five mld STP capacity is available and no sewage is actually treated. As such, the entire 28 mld of sewage is discharged into the Bay of Bengal. **Details of the project test checked in Puri which aimed to stop the Bay of Bengal from getting contaminated from sewage is discussed below:**

Project name	Findings
Sewage collection and Treatment System	• The project, which included construction of I&D, STP & MPS, was scheduled to be completed in March 2006. Though the scheduled date of completion was revised to March 2009, the project is still not complete. • The project was delayed due to (i) Submission of incorrect original DPR prepared by NEERI, Nagpur, (ii) Unfavourable site conditions and other technical reasons in Zone-B & C-I, (iii) Average soil condition (iv) High water level condition and (v) Delay in obtaining clearance from Odisha State Coastal Zone Management Authority (CSCZMA) etc. Further, delay in construction of I&D impacted the progress of STP proposed under the project.

Untreated sewage flowing into the Mahanadi

Untreated sewage flowing directly from STP into Bay of Bengal in Puri

4.2 NLCP

(a) Planning for NLCP

Bindusagar lake, which was the only lake in Odisha in the list of polluted lakes prepared by CPCB was selected under NLCP.

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Bindusagar lake	3.36	1.21	March 2007	Not completed

The project is discussed below:

Project name	Findings
Bindusagar lake	• Activities envisaged for restoration and conservation of the Bindusagar lake were providing simple and 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 and beautification, setting up of an Interpretation Centre etc. • The project was to be completed by March 2007 but it was not yet complete as the low cost sanitation had not yet been built and the construction of the interception and diversion sewers was also not complete. Further, it was observed that no remedial action was taken to start the non-functioning Bioremediation Plant and to connect all the septic tanks to the new sewerage system. • The State government did not provide reasons for non-completion of the project.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of Implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered Committee under CM
0 out of 7 projects	0 out of 7 projects	0 out of 7 projects	3 out of 7 projects

5.2 NLCP

By Inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water Quality monitoring plan
0 out of 1 project	0 out of 1 project	0 out of 1 project	0 out of 1 project

5.3 Ground water (in six blocks test checked)

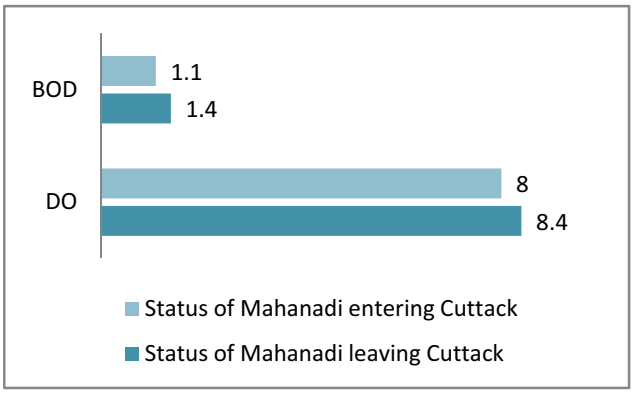
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes	Yes

6. Outcomes

6.1 NRCP

(a) Water quality in Mahanadi after Cuttack

The daily average sewage generated in the city of Cuttack is estimated to be 80 mld. However, only 37.5 mld is treated and the rest 42.5 mld is discharged into the Mahanadi.Five drains open into the river out of which four have been intercepted and one still needs to be intercepted. Status of Mahanadi on entering Cuttack and after leaving Cuttack in terms of DO and BOD is shown in the chart alongside. It can be seen that BOD actually rises after Mahanadi leaves Cuttack, highlighting the inadequate sewage treatment facilities. Further TC also rises from 1287 mpn/100ml at the time of entering Cuttack to 3967 mpn/100ml when Mahanadi leaves Cuttack.



6.2 NLCP

As the project on improving water quality of Bindusagar lake is still in progress, no conclusions could be drawn about impact of NLCP in restoring the lake.

State: Punjab

1. Background

The State of Punjab derives its name from 'Punj' and 'Aab' i.e. the land of five rivers namely Sutlej, Beas, Ravi, Jhelum and Chenab that flowed through the erstwhile Punjab.

According to the Central Ground Water Board, the annual replenishable ground water resources in the State are 23.78 Billion Cubic Meters (BCM), while the net annual ground water availability is 21.44 BCM. Ground water resources in the State are being used for drinking and irrigation to a large extent. The ground water is contaminated by salinity and presence of fluoride, chloride, iron and nitrate.

Test checked rivers in Punjab

Insitutional arrangements in the State: As per information provided by MoEF, the Department of Local Government, Government of Punjab was the nodal department and Punjab Water Supply and Sewerage Board (PWSSB) was the nodal implementing agency for NRCP in the State.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Punjab is discussed below:

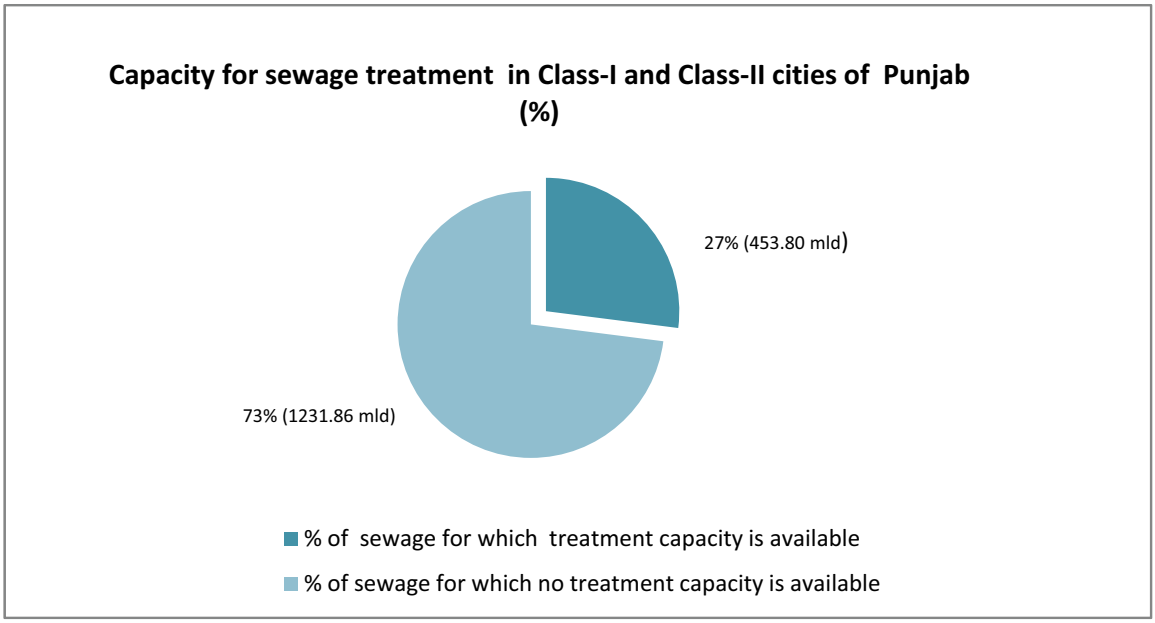
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Done	Could not be verified	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Could not be verified	Done (arsenic, nitrate, iron, fluoride and salinity)
	b) According to Biodiversity indicators	Done	Could not be verified	Not applicable
	c) Quantification of contaminants	Not Done	Could not be verified	Could not be verified
	d) Assessment of impact of human	Not Done	Could not be verified	Partially (Agriculture: Done,

	activities			Industry: Not Done, Uncontrolled disposal of human waste Not Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Done	Done	Not applicable
	b) Risks to aquatic species	Not Done	Not applicable	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Could not be verified, Industry: Could not be verified, Agriculture non point sources: Not done)	Partially (Source water protection: Not Done Industry: Could not be verified, Agriculture non point sources: Not Done)	Partially (Industry: Could not be verified, Agriculture non point sources: Not Done)
6. Constitution of Water Quality Review Committee		Done		

[Note: Not applicable: Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Punjab



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Punjab is 1685.66 mld, of which treatment capacity is available for only 453.80 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Sutlej river had been selected for pollution abatement under the National River Conservation Programme (NRCP). Projects are being implemented in six cities[29] situated on the banks of river Sutlej. 60 projects in these six towns were sanctioned under NRCP out of which 50 were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 215.68 crore. **Eight projects[30] being implemented under NRCP at a sanctioned cost of ₹141.52 crore were test checked for detailed examination.**

(i) Physical and financial progress

Name of the river/location	Name of the project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Sutlej/ Jalandhar	100 mld STP at Pholriwal	22.84	29.14	November 2004	March 2008
	MPS at Garha	8.79	8.79	August 2003	August 2005
Sutlej/ Ludhiana	111 mld STP at Bhattian	34.85	37.59	December 2004	March 2008
	152 mld STP at Balloke	34.79	42.67	January 2005	March 2008
	48 mld STP at Jamalpur	13.46	14.56	September 2005	March 2008
	MPS at Bhattian	8.03	7.50	August 2003	August 2003
	MPS at Balloke	14.92	15.27	August 2003	August 2003
	MPS at Jamalpur	3.84	3.23	August 2003	August 2003

(ii) Performance of the projects

(a) Jalandhar town

The average sewage generated in Jalandhar is 235 mld. However, treatment capacity is only 100 mld and only 82 mld of sewage is treated, leaving 153 mld of waste water to be discharged into the Sutlej. **Details of projects test checked in Jalandhar town to control pollution of Sutlej river are discussed below:**

Project name	Findings
STP at Garha (Pholriwal)	• The project was completed in March 2008 after a delay of three years and four months. The Implementing Agency had not submitted the completion report and final utilisation certificate to NRCD. • An expenditure of ₹ 29.14 crore was incurred against a sanctioned cost of ₹ 22.84 crore resulting in cost overrun of ₹ 6.3 crore. The reasons for cost overrun were late acquisition of land and increase in price of land.

[29] Ludhiana (District Ludhiana), Jalandhar, Phagwara, and Phillaur (District Jalandhar), Kapurthala and Sultanpur Lodhi (District Kapurthala)
[30] Two at Jalandhar and six at Ludhiana.

	• The project was delayed due to late acquisition of land. • The STP was constructed to treat 100 mld of sewage but it was treating only 82 mld sewage and rest 18 mld was flowing untreated into the river. The State government did not initiate any action to address the problem of underutilization. Resource recovery from the STP was also not taking place. • BOD was above prescribed limit in the months of April, June, July and October 2010. TSS was above prescribed limit in the month of June 2010 and pH and COD were within the prescribed limit whereas Oil & Grease were not being tested.
MPS at Garha:	• The project was completed in August 2005 after a delay of two years • The MPS received sewage of 125 mld (against designed capacity of 100 mld), however it pumped only 81.42 mld sewage to STP.

(b) Ludhiana

The average sewage generated in Ludhiana is 496 mld, however, sewage treatment capacity is only 311 mld and only 203 mld gets treated. As a result, 293 mld of untreated sewage is discharged into the Sutlej. **Details of projects test checked in Ludhiana town to control pollution of Sutlej river are discussed below:**

Project name	Findings
STP at Bhattian	• The project was completed in March 2008 after a delay of three years and three months. The Implementing Agency had not submitted the completion report and final utilisation certificate to NRCD. • An expenditure of ₹ 37.59 crore was incurred on the project against the sanctioned cost of ₹ 34.85 crore, resulting in a cost escalation of ₹ 2.74 crore. • The project was delayed due to late acquisition of land. • Though the STP capacity was 111 mld, it was underutilized as it was treating only 81 mld of sewage. The treated sewage is meeting the prescribed standards in relation to pH, BOD, COD and TSS. However, oil and grease were not being tested.
STP at Balloke	• The project was completed in March 2008 after a delay of three years and two months. The Implementing Agency had not submitted the completion report and final utilisation certificate to NRCD. • An expenditure of ₹ 42.67 crore was incurred on the project against the sanctioned cost of ₹ 34.79 crore, resulting in a cost escalation of ₹ 7.88 crore. • The project was delayed due to late acquisition of land and abandonment of work by contractual agency and re-tendering of work. • Though the STP capacity was 152 mld, it was treating only 74 mld of sewage. Further STP was receiving dairy waste i.e cow

	dung, wheat husk and green fodder which was affecting the performance of the STP. The BOD was above prescribed limit in the month of August 2010. TSS, pH and COD were within prescribed limit whereas oil & grease were not being tested.
STP at Jamalpur	• The project was completed in March 2008 after a delay of two years and six months. The Implementing Agency had not submitted the completion report and final utilisation certificate to NRCD. • An expenditure of ₹ 14.56 crore was incurred on the project against the sanctioned cost of ₹ 13.46 crore resulting in cost escalation of ₹1.10 crore. • The project was delayed due to non clearance of site by Municipal Corporation. • The STP's capacity was 48 mld and it was treating 48 mld of waste water. The performance of the STP was being affected due to inflow of industrial waste, delay in chlorination work and non availability of uninterrupted power. BOD and TSS were above prescribed limit in the month of August 2010.
MPS at Bhattian	• The project scheduled for completion in August 2003 was completed on time. • The MPS has been receiving untreated industrial effluents due to which it was overloaded and its condition had deteriorated its performance. The MPS had to be shut down frequently due to power cuts and the case for hot line connection for electricity was pending due to want of fund from Municipal Corporation, Ludhiana.
MPS at Balloke	• The project scheduled for completion in August 2003 was completed on time. • An expenditure incurred on the project was ₹ 15.27 crore against a sanctioned cost of ₹ 14.92 crore resulting in cost escalation of ₹ 35 lakh. • The MPS was receiving dairy waste that is cow dung, wheat husk and green fodder from the nearby dairy complex which was affecting its performance.
MPS at Jamalpur	• The project was scheduled for completion in August 2003 was completed on time. • The MPS was receiving untreated industrial effluents affecting its performance and deteriorating its performance. The MPS had to be shut down frequently due to power cuts and the case for hot line connection for electricity was pending due to want of fund from MC Ludhiana.

Thus, the sewerage treatment facilities installed projects for prevention of pollution of Sutlej in the towns of Jalandhar and Ludhiana were not working to full potential as envisaged.

4.2 NLCP

No lake in Punjab was included for conservation and renovation under NLCP.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered Committee under CM
0 out of 8 projects	0 out of 8 projects	8 out of 8 projects	8 out of 8 projects

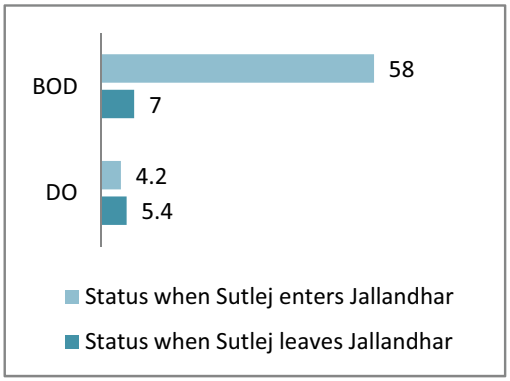
5.2 Ground water (in six blocks test checked)

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	1 out of 6	Yes	Yes

6. Outcomes

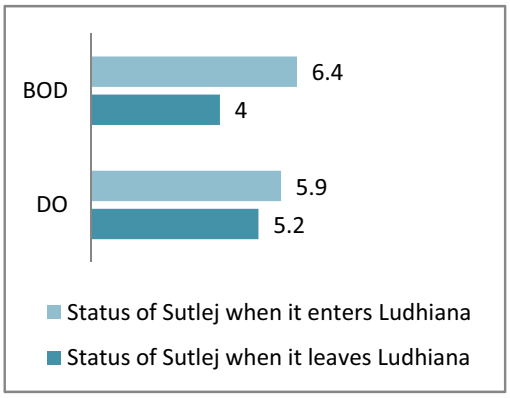
6.1 NRCP

(a) Water quality of Sutlej after Jalandhar



Status of water quality of river in terms of BOD and DO before entering Jalandhar and after leaving Jalandhar town is shown in the figure alongside. Apart from BOD and DO, the TC count of Sutlej falls from 1500000 to 50000 after it leaves Jalandhar. While there was improvement in water quality, BOD was still 2.3 times the criteria, TC was 100 times the criteria in Sutlej as it left Jalandhar. This indicated organic pollution as well as presence of disease causing, fecal-related bacteria, viruses and protozoa which cause illness.

(b) Water quality of Sutlej after Ludhiana



Status of water quality of Sutlej in terms of BOD and DO before entering Ludhiana and after leaving Ludhiana town is shown in the figure alongside. Apart from BOD and DO, the TC count of Sutlej increases from 500 at the time of entering Ludhiana to 22,000 after it leaves Ludhiana which shows decline in water quality. While DO did not exceed the criteria, TC was 44 times the criteria in Sutlej river as it left Ludhiana city, indicating the presence of a large number disease causing, fecal-related bacteria, viruses and protozoa which cause illness.

State: Rajasthan

1. Background

Some of the rivers in Rajasthan are Arvari River, Banas River, Berach River, Chambal River, Ghaggar-Hakra river, Gomati River, Kali Sindh River, Luni River, Mithari River, Sabarmati River, etc. Some of the lakes in Rajasthan are Ana Sagar lake, Balsamand lake, Man Sagar Lake, Nakki Lake, Lake Pichola, Pushkar Lake, Rajsamand Lake, Sambhar Salt Lake etc. According to Central Ground Water Board, the annual replenishable ground water resources in Rajasthan was 11.56 Billion Cubic Meters (BCM) and the net annual ground water available was 10.38 BCM. Out of 236 blocks, in 140 blocks in Rajasthan the ground water was over-exploited, in 50 blocks it was critical and 14 blocks the ground water was semi-critical. Contaminants like salinity, fluoride, chloride, iron and nitrate affected ground water.

Test checked rivers and lakes in Rajasthan

Insitutional arrangements in the State: As per information provided by MoEF, Local Self Government Department, Government of Rajasthan was the nodal department while implementing agencies are Public Health Engineering Department and Rajasthan Urban Infrastructure Development Project for NRCP. Jaipur Development Authority and Rajasthan Urban Infrastructure Development Project (RUIDP), Government of Rajasthan is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Rajasthan is discussed below:

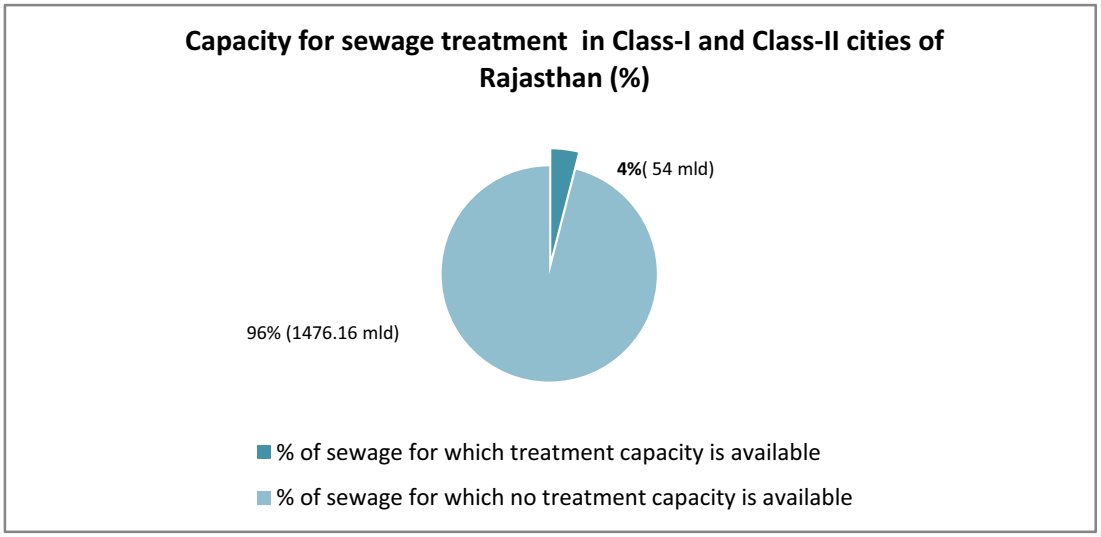
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Could not be verified	Could not be verified	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Not Done	Not Done	Done
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified
	d) Assessment of impact of human activities	Not Done	Not Done	Could not be verified

3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Not Done, Industry: Not Done, Agriculture non point sources: Not Done)	Not Done	Not Done
6. Constitution of Water Quality Review Committee		Could not be verified		

[**Note: Not applicable :** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Rajasthan



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Rajasthan is 1530.16 mld, of which treatment capacity is available for only 54 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

River Chambal Kota had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects are being implemented in two cities viz. Kota and Keshoraipattan.Eight projects in these two towns were sanctioned under NRCP out of which five were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 150.95 crore. **Four projects being implemented under NRCP at a cost of ₹ 150.23 crore were test checked for detailed examination.**

(i) Physical and financial progress

Name of the river/ location	Name of project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Chambal/ Kota	STP 30 & 6 mld and I&D	149.59	25.33	March 2015	On going
	LCS	0.55	0.46	March 2001	Completed but date of completion not available
	RFD	0.07	0.13	December 2000	December 2000
	Improved Wood crematoria	0.02	0.02	April 2000	April 2000

(ii) Performance of the projects

(a) Kota

The average sewage generated in the city of Kota is 97.29 mld. The STP capacity available was only 20 mld. However, the entire 97.29 mld untreated sewage is discharged into the Chambal. 22 drains are falling into the river. However, all drains were yet to be intercepted. **Details of four projects test checked in Kota which aim to improve the quality of water in Chambal are discussed below:**

Project	Findings
STP 30 & 6 mld and I & D	• The project was sanctioned in October 2009 with scheduled date of completion by March 2015. • An expenditure of ₹ 25.33 crore was incurred on the project upto June 2011 and the project was still ongoing.
LCS	• The project was completed after incurring an expenditure of ₹46.44 lakh.
RFD	• The project was completed on time in December 2000. • An expenditure of ₹ 12.54 lakh on the project against the sanctioned cost of ₹ 6.80 lakh, resulting in cost escalation of ₹ 5.74 lakh. The excess expenditure had been incurred in larger public interest by Nagar Nigam Kota from its own resources.
Improved Wood Crematoria	The project was completed on time in April 2000.

4.2 NLCP

Five lakes namely Mansagar lake, Annasagar lake, Pushkar lake, Fatehsagar lake and Pichola lake had been selected for pollution abatement projects under the National Lake Conservation Programme (NLCP). Out of these, three lakes having sanctioned cost of ₹ 157.83 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion

Mansagar	22.39 revised to 24.72	24.72	March 2004 revised to March 2007	Ongoing
Pushkar	48.36	27.14	August 2010	Ongoing
Pichola	84.75	3.84	February 2012	Ongoing

These projects are discussed below:

Project name	Findings
Mansagar Lake	• 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 physico-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. The commissioning of in-situ Bioremediation and Wetlands was still pending for want of achieving desired quality parameters. • The project was delayed due to land acquisition for setting up constructed wetlands approved as an integral component under the project. However, scrutiny revealed that there was delay in availability of land for construction of physico chemical treatment plant. • An expenditure of ₹ 24.72 crore was incurred upto May 2011. • The levels of Biochemical Oxygen Demand had come down after implementation of the project for conservation and restoration of Mansagar lake, however, they were still above the criteria, signifying high levels of organic pollution in the lake.
Pushkar Lake	• The restoration and conservation of Pushkar Lake involved activities like de-silting, lake front development, aeration with ozoniser, afforestation, inlet-outlet arrangement etc. • The project was scheduled to be completed by August 2010 but it was not yet complete. Till November 2010, the de-silting work and building of toilets, aeration, construction of inlet-outlet and settling tank were completed. The lake front development works, works relating to afforestation were still ongoing. • The works for conservation of Pushkar lake included hydraulic improvement of feeders including Pushkar Feeder with most of its stretch in Forest area. The required clearance from the Forest Department was delayed and could be obtained only in December 2010. The work order for that component was issued in December 2010. As informed by the State Government, the project was now scheduled for completion in December 2011.
Pichola lake	• The restoration and conservation of Pichola Lake involved activities like de-silting, storm water management and development of artificial wetland, hydraulic improvement of feeder and other channels, shore line demarcation and protection etc. • The scheduled date of completion of the project is February 2012.

- An expenditure of ₹ 3.84 crore was incurred on the project up to May 2011.
- The I&D works could not be taken up due to stay granted by Hon'ble High Court on the STP land. Further, the proposal of M/s Hindustan Zinc Ltd. to establish 20 mld STP at the available site was presently under consideration by the project proponents. For other works like de-weeding, water quality monitoring, aeration etc, tenders were invited 2-3 times to select technically responsible bidders. Delay in project implementation was also due to demarcation of Lake Boundary not completed by Water Resources Department.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

Chief Executive of Implementing Agency	Divisional Project Monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered Committee under CM
1 out of 4 projects	0 out of 4 projects	In 1 out of 4 projects	0 out of 4 projects

5.2 NLCP

Inter-Departmental coordination committee	Steering Committee at the district level	Lake specific Monitoring Committee	Water quality monitoring plan
3 out of 3 projects	3 out of 3 projects	3 out of 3 projects	0 out of 3 projects

5.3 Ground water (in five blocks test checked)

5 blocks were chosen for assessment of monitoring network with respect to ground water. These were Udaipur, Jalore, Jaipur, Pali and Tonk.

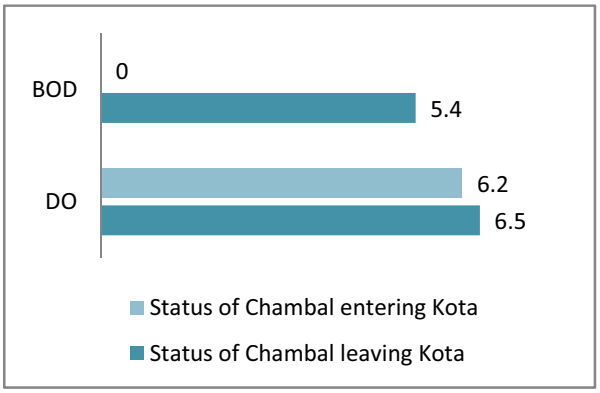
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Partially (Yes for two blocks, no information for two blocks and absent in remaining 2)	Partially (Yes in 4 blocks, Not Done in two blocks)	Yes	Could not be verified

6. Outcomes

6.1 NRCP

Quality of water in Chambal after Kota

Status of Chambal on entering Kota in terms of DO and BOD is shown in the chart alongside. It can be seen that BOD actually rises after Chambal leaves Kota, highlighting the inadequate sewage treatment facilities. TC was also almost five times the criteria in Chambal river as it left Kota city indicating the presence of a large number disease causing, fecal-related bacteria, viruses and protozoa.



6.2 NCP

As the projects on improving water quality of Pichola and Pushkar lake are still in progress, no conclusions could be drawn about impact of NLCP in restoring these lakes. It was observed that the levels of Biochemical oxygen Demand had come down after implementation of the project for conservation and restoration of Mansagar lake.

7 Monitoring network for tracking pollution of ground water

(i) Implementation of Rajasthan Integrated Fluorosis Mitigation Programme (RIFMP).

To achieve the prevention and control measures for mitigation of fluorosis, the Rajasthan Integrated Fluorosis Mitigation Programme was conceived in which the fluoride affected villages were planned to be covered in three phases

- I Phase started in March 2005 and completed in February 2008
- II phase started in 17 August 2006 and still in progress
- III phase has not yet been started

Audit scrutiny revealed the following:

- There was tardy progress in execution of the scheme as the phase I of the project envisaged to provide fluoride free drinking water to 2643 villages and dhanis through OHSR, HP attached defluoriedunits and DDFUs upto March 2005. But only 1681 villages/habitations (64%) were benefited upto February 2008.
- There was wasteful expenditure of ₹ 79.25 lakh on installation of handpump attached defluoridation units (HPADFUs)
- Funds amounting to ₹ 51.87 lakh were blocked due to non-distribution of domestic defluoridation units.
- Domestic defluoridation units were not maintained properly as the chemical (activated alumina) were not provided to the users.
- 100 roof top rainwater harvesting structures were proposed to be constructed in village/habitation having population less than 100 souls. However, these were not constructed in any of the village/habitation.
- Guidelines of National Rural Drinking Water Programme (NRDWP) envisaged that Field Testing Kits (FTKs) will be provided to each Gram Panchayat for testing the quality of water being made available to villagers to know about the existence of various chemicals including fluoride. It was observed that against the total requirement of 318316 FTKs (Chemical and Bacteriological), 100665 FTKs were short purchased. Further, out of 217651 FTKs purchased, 27152 FTKs were short distributed, due to which the purpose of the scheme to provide safe and fluoride free water to about 40 per cent population could not be achieved.

State: Sikkim

1. Background

Teesta & Rangit are the major rivers of the State. Some of the major lakes in Sikkim are Khecheoperi, Gurudungmar, Lam Pokhari, Changu, Laxmi Pokhari etc. According to Central Ground Water Board, annual replenishable ground water resource in Sikkim is 0.08 Billion Cubic Meters (BCM) while the net annual ground water availability is 0.08 BCM. In none of the blocks is the ground water over-exploited, critical or semi-critical.

Rivers test checked in Sikkim

Insitutional arrangement in the State: As per information provided by MoEF, the nodal agency for implementation of NRCP was Water Security & Public Health Engineering Department, Government of Sikkim.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in Sikkim is discussed below:

		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Not Done	Could not be verified
2. Assessment of water quality	**a) According to chemical Indicators**	Not Done	Not Done	Could not be verified
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified
	d) Assessment of impact of human activities	Not Done	Not Done	Could not be verified
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to	Not Done	Not Done	Not Done

human health			
4. Policy for water pollution	Could not be verified	Could not be verified	Could not be verified
5. Programmes for prevention and control of water pollution	Partially (Source water protection: Could not be verified, Industry: Could not be verified, Agriculture non point sources: Done)	Partially (Source water protection: Could not be verified, Industry: Could not be verified, Agriculture non point sources: Done)	Could not be verified
6. Constitution of Water Quality Review Committee	Done		

[**Note: Not applicable :** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Implementation of programmes for control of water pollution

3.1 NRCP

In Sikkim, Rani Chu river had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects were being implemented in three cities viz., Gangtok, Singtom and Raniphool. Six projects in these three towns were sanctioned under NRCP out of which one was completed as of March 2010. The total sanctioned cost of all the projects was ₹114.31 crore. **Two projects being implemented under NRCP in Gangtok at a cost of ₹ 25.16 crore were test checked for detailed examination.**

(i) Physical and financial progress

Name of the river/location	Name of project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Rani-Chu/ Gangtok	Sewerage and STP	15.81 revised to 17.17	17.12	March 2008	January 2011
	Rehabilitation of Main Sewer Line including construction of STP	7.99	5.93	July 2010	Not completed

(ii) Performance of the projects

(a) Gangtok:

The average sewage generated in the city of Gangtok is 11 mld. However, only eight mld is treated and the rest three mld is discharged into the Rani Chu.

Details of two projects test checked in Gangtok which aim to improve the quality of Rani Chu's water quality are discussed below:

Project	Findings
Sewerage and STP	• The project was completed in January 2011 after a delay of two years and ten months. • The project was delayed due to reasons like frequent

	blockage of roads, budgetary constraints due to delay in release of State share, unexpected hard rock during excavation of foundation etc. • The completion of the project had not yet been assessed by the State on basis of set targets/ performance milestones.
Rehabilitation of Main Sewer Line and construction of STP	• The project scheduled for completion in July 2010 was not yet complete. • The project was delayed due to reasons like unforeseen blockage of roads and time taken for finalization of appropriate technology for STP.
Thus both the test checked projects had failed to meet the objectives of controlling pollution of Rani Chu river.	

Direct dumping of household waste into Rani Chu

Direct dumping of waste into Rani chu

3.2 NLCP

Despite presence of many lakes in Sikkim, none of them were taken up for restoration under NLCP. None of the lakes in Sikkim however figured in the list of polluted lakes identified by CPCB.

4. Monitoring of programmes for control of water pollution

4.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High Powered Committee under CM
2 out of 2 projects	0 out of 2 projects	2 out of 2 projects	0 out of 2 projects

4.2 Ground water

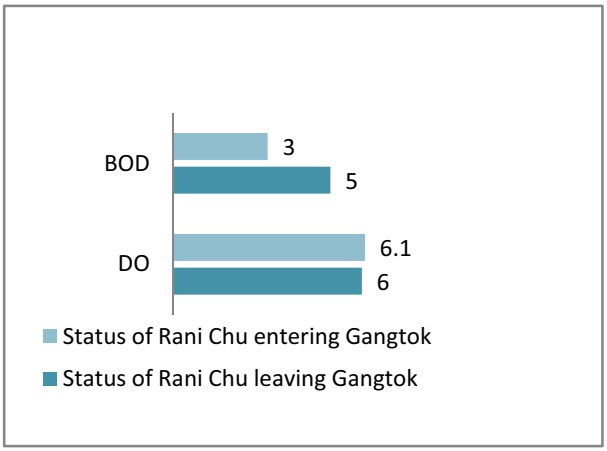
No programmes or monitoring network by the State government exists due to absence of ground water pollution in the State.

5. Outcomes

5.1 NRCP

a) Water quality of Rani Chu after Gangtok

Status of Rani Chu on entering Gangtok and after leaving Gangtok in terms of DO, and BOD is shown in the chart alongside. The DO met the required criteria. However, the value of BOD actually rises after Rani Chu leaves Gangtok signifying inadequate sewage treatment facility.



State: Tamil Nadu

1. Background

The major rivers in Tamil Nadu are Cauveri, Palar, Pennar, Vaigai, Cooum, Vennar and Tamiraparani. Some of the important lakes in Tamil Nadu are Berijam Lake, Chembarambakkam Lake, Kodaikanal Lake, Ooty Lake, Pulicat Lake, Veeranam Lake etc. According to Central Ground Water Board, the annual replenishable ground water resources in the State are 23.07 Billion Cubic Meters (BCM) out of which the net annual ground water availability is 20.76 BCM. Out of 384 blocks in the State, in 142 blocks the ground water is over-exploited, in 33 blocks it is critical and in 57 blocks it is semi-critical.

Test checked rivers and lakes in Maharashtra

Insitutional arrangement in the State: As per information provided by MoEF, Department of Environment & Forests, Government of Tamil Nadu and, Municipal Administration & Water Supply Department (MAWSD) Department Government of Tamil Nadu were the nodal departments and Environmental Management Agency of Tamil Nadu, Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB), Tamil Nadu Water Supply and Drainage Board and Commissioner of Municipal Administration were the implementing agencies for NRCP. Environment Management Agency is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Tamil Nadu discussed below:

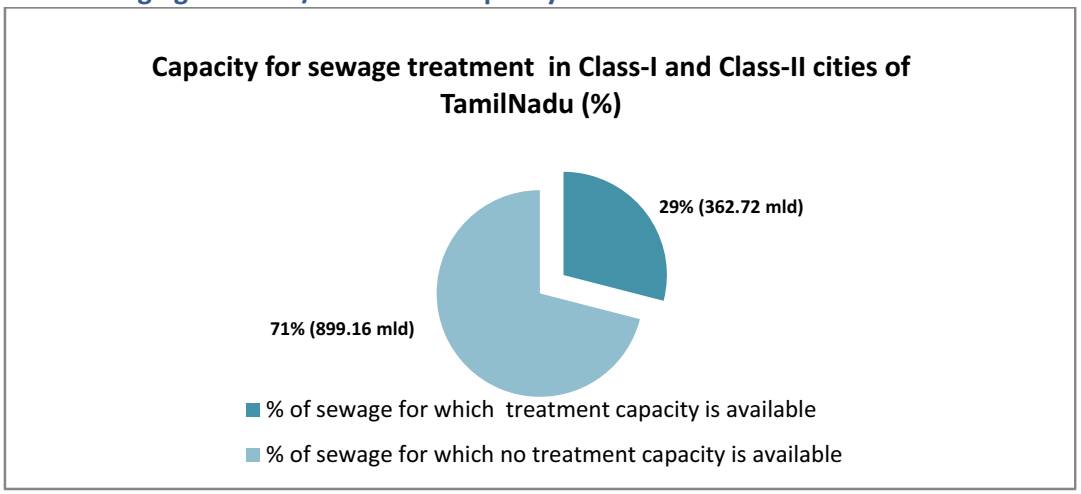
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Could not be verified	Done	Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Done	Done
	b) According to Biodiversity indicators	Done	Done	Not applicable

	c) Quantification of contaminants	Partially (Nutrients: Done, Pathogenic organism: Not Done, Human produced chemicals: Done)	Partially (Nutrients: Done, Pathogenic organism: Not Done, Human produced chemicals: Done)	Could not be verified
	d) Assessment of impact of human activities	Partially (Agriculture: Done, Industry: Done, Mining: Could not be verified, Dam: Done, Uncontrolled disposal of human waste: Not Done)	Partially (Agriculture: Done, Industry: Done, Uncontrolled disposal of human waste: Not Done)	Partially (Agriculture: Done, Industry: Done)
3. Identification of risks to environment and health	**a) Risks to wetlands**	Done	Done	Not applicable
	b) Risks to aquatic species	Could not be verified	Could not be verified	Not applicable
	c) Risks to human health	Could not be verified	Could not be verified	Could not be verified
4. Policy for water pollution		Could not be verified	Could not be verified	Could not be verified
5. Programmes for prevention and control of water pollution		Partially (Source water protection: Done, Industry: Not Done, Agriculture non point sources Could not be verified)	Partially (Source water protection: Done, Industry: Done Agriculture non point sources Could not be verified)	Not Done
6. Constitution of Water Quality Review Committee		Not Done		

[**Note: Not applicable :** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Tamilnadu



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Tamilnadu is 1261.88 mld, of which treatment capacity is available for only 362.72 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Cauvery, Adyar, Cooum, Vennar, Vaigai and Tambrabarani rivers had been included under the National River Conservation Programme (NRCP) for pollution abatement projects. Projects were being implemented in 13 cities[31]. 83 projects in these 13 cities were sanctioned under NRCP out of which 52 were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 915.93 crore. 11 projects[32] being implemented under NRCP at a cost of ₹ 408.01 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/location	Name of the project	Sanctioned Cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Adyar & Cooum/ Chennai	STP at Koymbedu (60 mld)	27.21	25.02	March 2005	April 2005
	STP at Kodungaiyur (110 mld)	41.56	45.96	March 2005	July 2006
	STP at Perungundi	36.88	31.04	March 2005	July 2006
	STP at Nesapakkam	21.21	19.16	March 2005	May 2006
	I& D package VII	14.74	12.44	September 2003	September 2004
	I&D Package VIII	19.49	14.49	September 2003	August 2004
Cauvery/ Tiruchirappalli	I&D and STP	116.67	114.85	September 2006	May 2008
Vaigai/ Madurai	I&D Part I	42.53	46.65	March 2003	July 2005
	I&D Part II	70.25	70.24	October 2005	Februry2010
	I&D Phase IV	7.32	9.66	July 2008	Ongoing
	STP Phase II	10.15	Work dropped from NRCD and taken up under JNNURM	Not applicable	Not applicable

(ii) Performance of the Projects

(a) Chennai

The average estimated sewage generated in the city of Chennai is 731 mld. However, only 481 mld is treated and the rest 250 mld is discharged into the Adyar/Cooum. Out of 638

[31] Bhawani, Chennai, Erode, Kumarapalayam, Pallipalayam, Trichy, Karur, Kumakonam, Mayiladuthurai, Tirichirapalli, Thanjavur, Madurai and Tirunelveli

[32] Six projects pertaining to Adyar & Cooum in Chennai, one project in Tiruchirappalli for river Cauvery and four projects at Madurai pertaining to river Vaigai.

drains opening into the Adyar/Cooum, only 307 have been intercepted and 331 remain to be intercepted. **Details of projects test checked in Chennai which aim to improve the quality of water in Adyar/Cooum are discussed below:**

Project name	Findings
STPs at Koymbedu, Kodungaiyur, Perungundi and Nesapakkam	• One STP at Koymbedu was constructed after a delay of one month; another at Kodungaiyur got delayed for one year and four months due to unprecedented rains, tsunami and problems due to inaccessibility of the site. • The STP at Perungundi also got delayed for one year and four months due to delay in getting permission for laying gravity main in the absence of an alternate route. • The construction of the STP at Nesapakkam got delayed by one year and two months due to additional soil strengthening measures suggested by Anna University. • All the STPs were working at their envisaged capacity and no problems were reported in their functioning. • Completion reports and final utilisation certificates of all the four STPs had not yet been submitted to MoEF despite their completion during 2005-07. • The combined sewage treatment capacity of all the four STPs was 481 mld which was inadequate as the estimated sewage flow from Chennai was 731 mld and hence 250 mld of sewage was left untreated and which flowed into the Adyar/Cooum.
I&D package VII and VIII	• The projects were completed in September 2004 and August 2004 respectively after a delay of almost one year. • Funds received from MoEF for both the projects were not kept in saving bank Account and the interest of ₹3.34 crore earned on mobilization advance was credited to Board's account instead of the Project Account. • Rehabilitation of slum families was envisaged which was not done. Also, sewage outfall outside Chennai area was not assessed as envisaged. On completion, performance of the projects had not been assessed by the State on basis of set targets/ performance milestones.

(b) Tiruchirappalli- Srirangam

The average estimated sewage generated in the city of Tiruchirappalli- Srirangam is 40.50 mld and the same is totally treated.

Details of one projects test checked in Tiruchirappalli**- Srirangam which aim to improve the quality of water in Cauvery is discussed below:**

Project	Findings
I&D and STP	• The projects were completed in May 2008 after a delay of one year and eight months. • The project was delayed due to high water table in Srirangam area and delay in laying deeper sewer.

	• The land cost of ₹ 71.44 lakh for the pumping stations for Trichy-Srirangam UGSS was charged to the works expenditure reported to NRCD and of which ₹ 47.41 lakh was met from the funds of GOI which was unauthorized. In May 2011, Government of Tamil Nadu replied that out of ₹ 71.44 lakh towards land cost a sum of ₹ 58.68 lakh had already been withdrawn and added to Government of Tamil Nadu/Local Body share. For the balance amount of ₹ 12.76 lakh, necessary instructions had been issued to the concerned authorities to withdraw the amount from GOI share. • Certain areas were not covered by providing House Service Connections (HSCs).

(c) Madurai

The average estimated sewage generated in the city of Madurai is 170 mld. However, only 45 mld is treated and the rest 125 mld is discharged into the Vaigai river. Out of 20 drains opening into the Vaigai river, only six have been intercepted and 14 remaining to be intercepted.

Details of four projects test checked in Madurai which aim to improve the quality of water in Vaigai are discussed below:

Project	Findings
I&D Part I and I&D Part II	• The project I&D Part I was completed in July 2005 after a delay of two years and four months. • An expenditure of ₹ 46.65 crore was incurred on the project against the sanctioned cost of ₹ 42.53 crore resulting in cost overrun of ₹ 4.12 crore which was due to price escalation and railway crossing work. • The project was delayed due to delay in carrying out the railways crossing work. • Under of the project, 122.44 kms of pipes were to be laid but only 107.03 kms were actually laid. The created capacity of the pumping station was 16 mld but only eight mld capacity was being utilised till date. • The project I&D Part II was completed in February 2010 after a delay of four years and four months. • The project was delayed due to delay in handing over of the site (National Highway/ State Highway) for construction of pumping station and execution of additional length of collection system. • The pumping station of 36 mld was built under the project but only 26 mld was being utilised. The infrastructure created has been handed over to the Madurai Corporation. • The State Government did not assess the performance of both the projects on the basis of set targets due to non -completion of Phase III.
I&D Phase IV	• The project scheduled to be completed by July 2008, was yet to commence.

	• The project was delayed due to lack of response by contractors to successive tenders.
STP-Phase II	• The work was dropped under NRCD due to non-identification of huge land for STP and was taken up by the Corporation under JNNURM. • The infrastructure created for I&D projects (I&D Phase Part I, Part II and Part IV) under NRCD at a cost of ₹ 116.89 crore were being kept idle for want of completion and commissioning of STP.
Thus projects in Tiruchirappalli- Srirangam, Chennai and Madurai to control pollution of Cauvery, Adyar/Cooum and Vaigai rivers respectively had not completely achieved their objectives.	

4.2 NLCP

Out of the two lakes of Tamil Nadu in the polluted list, one of them, Kodaikanal lake was selected for detailed audit scrutiny.

(i) Physical and financial performance

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Kodaikanal	5.13 revised to 10.42	2.22	December 2002 revised to January 2009	On going

(ii) The project is discussed below:

The activities sanctioned for restoration and conservation of Kodaikanal Lake and its progress was as follows:

Project name	Findings
Kodaikanal Lake	• The project was originally scheduled to be completed by December 2002. In January 2007 the project duration was extended upto January 2009. The start of the project was delayed due to litigation and court stay order. The expenditure on the project till October 2010 was ₹ 2.22 crore.
	Details of implementation of activities under the project are discussed below: **(i) Interception and diversion of sewage from 19 outfalls and carry the same to STP to be built with FAB reactor**: This was to be implemented by Tamil Nadu Water Supply and Sewerage Board. The original site for location of STP was at KKR Kalai Arangam, near the lake. Therefore, the United Citizen Council of Kodaikanal filed a writ petition on the plea that the location of STP would pollute the lake. Similar objections were raised on two more locations. This was due to non-consultation with local public regarding location of STP. Further, there was no coordination between the different implementing agencies

which led to non- completion of the project. Land for the STP had not been acquired as yet.

(ii) In-situ cleaning of the lake using bio-remediation technology:
This was to be implemented by Public Works Department. The court had stopped construction of the STP and as the in-situ cleaning of the lake was independent of construction of the STP and the implementing agency could have sought permission from the courts to proceed with the in-situ works. However, this was not done and the work of de-weeding and bio-remediation remained incomplete, causing an increase in fecal coliform levels as reported by MINARS.

(iii) **Low cost sanitation, de-silting and removal of weeding:**
This was to be implemented by the local body but work had not been taken up as yet.

Thus, the project taken up for restoration and conservation of Kodaikanal lake had failed to meet its objectives and the water in the lake remained polluted and no measures were in place to prevent any more pollution of the lake.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of Implementing agency	By Divisional Project Monitoring Cell	Steering Committee chaired by Chief Secretary of State	High Powered committee under CM
11 out of 11 projects	1 out of 11 projects	0 out of 11 projects	0 out of 11 projects

5.2 NLCP

By Inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 1 projects	0 out of 1 projects	0 out of 1 projects	1 out of 1 projects

5.3 Ground water (in six blocks test checked)

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Yes	Yes in 3 out of 6

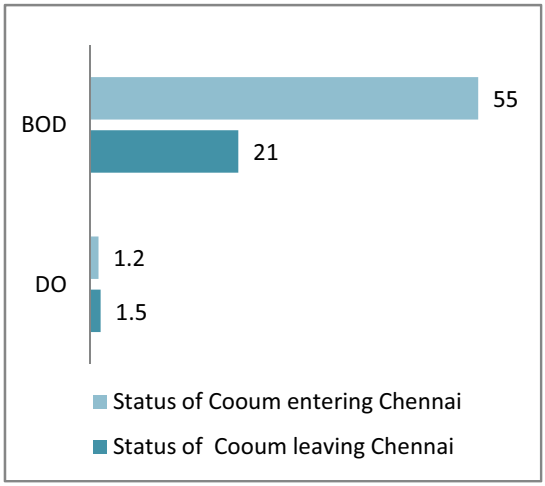
It was also observed that the CPCB conducted the survey to identify the critically polluted industrial clusters as early in December 2009 and Cuddalore industrial cluster was identified as one among them with 77.45 Score. We noticed that a draft action plan was prepared by TNPCB and submitted to its Board during August 2010 for approval. However, approval was still pending. Trade effluents discharged by M/s CUSECS had exceeded the quality pollution parameters prescribed most of the times endangering the health of the people in the impact zone of habitations and finally due to the intervention of the Hon'ble Madras High Court, the operation of M/s CUSECS was stopped vide order dated 21/3/2010. On perusal of renewal of Consent mechanisms of the industries, it was observed in audit that the renewal of consents were given to the industries most of the time even though they did not satisfy completely all the pollution parameters prescribed by the Board.

6. Outcomes

6.1 NRCP

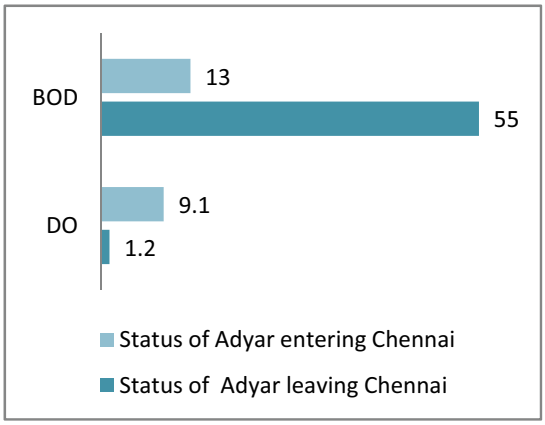
(a) Water quality of Adyar/Cooum after Chennai

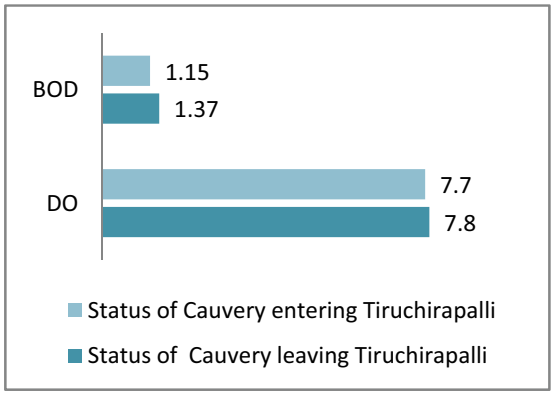
Status of Adyar/Cooum on entering Chennai and after leaving Chennai in terms of DO and BOD is shown in the chart alongside. BOD was more than 18 times and seven times the criteria in Adyar & Cooum river respectively, indicating high levels of organic pollution. Further, the DO was less than the criteria indicating insufficient oxygen being available for survival of aquatic life. Further, the TC was higher than the criteria, indicating that Adyar & Cooum, were full of disease causing, fecal-related bacteria, viruses and protozoa which cause illness.



(b) Water quality of Cauvery river after Tiruchirappalli**- Srirangam**

Status of Cauvery river on entering Tiruchirappalli and after leaving Tiruchirappalli in terms of DO and BOD is shown in the chart alongside. The value of BOD actually rises after Cauvery leaves Tiruchirappalli signifying inadequate sewage treatment facility. While DO met the criteria TC was much higher than the criteria,indicating that Cauvery was full of disease causing, faecal-related bacteria, viruses and protozoa which causes illness.





6.2 NLCP

Since work was not yet complete, no impact of NLCP was felt on the quality of water in Kodaikanal lake, which remained poor.

7. Monitoring network for tracking pollution of ground water

(i) Implementation of Fluoride Mitigation Programme

The ground water in Tamil Nadu contained contaminants like fluoride, salinity, chloride, iron, nitrate[33] etc. it was observed that the State government had initiated Fluorisis 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 fluorisis in these districts. The scheduled date of completion was May 2013.The programme is now being implemented with assistance from Japan International Cooperation Agency and was being executed by TWAD 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.

[33] According to CGWB

State: Tripura

1. Background

Some of the rivers flowing in Tripura are Longai, Juri, Dhalai, Gomati, Manu, Khowai, Haora etc. Tripura is blessed with a large number of natural and artificial lakes like Dumboor lake, Durgabari lake, Dimsagar Lake, Laxminarayanbari lake, Rudrasagar Lake, Kamala Sagar etc. According to Central Ground Water Board, the annual replenishable ground water resource in Tripura is 2.19 Billion Cubic Meters (BCM) and net annual ground water availability is 1.97 BCM. Some of the districts in Tripura are affected by iron.

Lakes test checked in Tripura

Institutional arrangements in the state: As per information provided by MoEF, the nodal agency for implementation of NLCP was Urban Develpment Department and Agartala Municipal Council (AMC) is the implementing agency.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Tripura is discussed below:

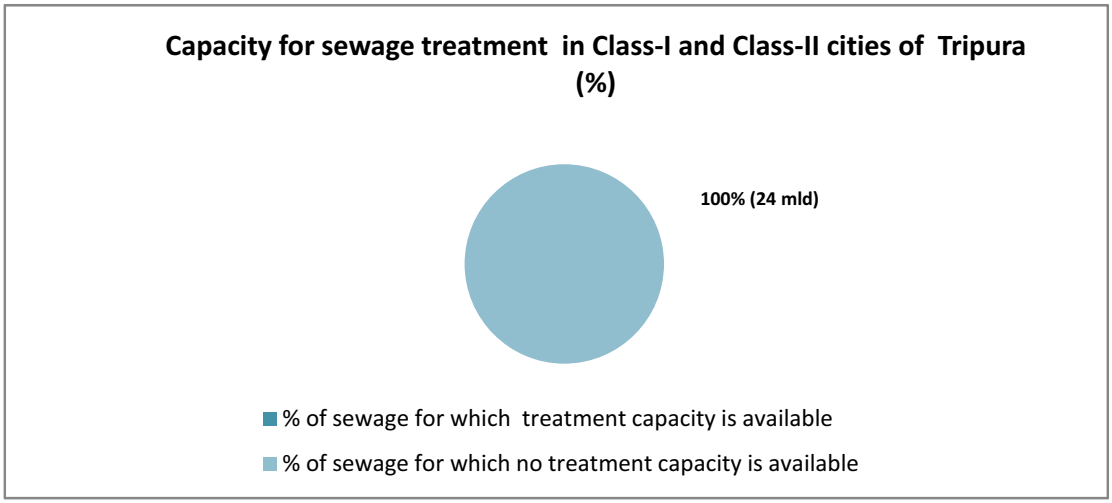
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Not Done	Not Done
2. Assessment of water quality	**a) According to Chemical indicators**	Not Done	Not Done	Not Done
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified
	d) Assessment of impact of human activities	Not Done	Could not be verified	Not Done
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done

5. Programmes for prevention and control of water pollution	Not Done	Not Done	Not Done
6. Constitution of Water Quality Review Committee	Done		

[Note: Not applicable: Does not pertain to Ground Water. Could not be verified: Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Tripura



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Tripura is 24 mld, of which no treatment capacity is available.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Though Tripura State Pollution Control Board (TSPCB) had identified polluted stretch in downstream of river Haora in Agartala as polluted, no rivers in Tripura had been included under NRCP.

4.2 NLCP

3 lakes in Tripura, Dimsagar, Laxminarayanbari and Durgabari were selected under NLCP for restoration and conservation. However, selection of the three lakes under NLCP did not meet the selection criteria set out by MoEF with respect to physical parameters and were also not identified by TSPCB as polluted. According to MoEF, only those lakes were to be selected which were more than 10 hectares (25 acres) and which were at least three meters deep. It was observed that Dimsagar was 3.3 acres, Laxminarayanbari was 7.2 acres and Durgabari was 7.3 acres. Further, the lake depths of Dimsagar and Durgabari were only 1.70 meters and 2.50 meters respectively whereas Laxminarayanbari met the depth criteria as it was three meters deep. As such, two of the lakes did not qualify for selection under NLCP.

Before initiation of NLCP, Tripura government conducted a study of 20 lakes of Tripura through a consultant and collected data with regard to their characteristics. After discussion with Urban Development Department, Tripura Government, a list of seven lakes was finalised for investigation, project preparation and submission for inclusion under NLCP. The survey concluded that all the seven lakes in the list were polluted while the level of pollution in Durgabari Lake and Laxminarayanbari lake was lower. The main sources of pollution identified were waste water influx, bathing, washing with use of detergents, ceremonial dumping of idols and use of lakes for dumping solid waste. All the lakes were also found to be weed-infested.

(i) Physical and financial progress

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Dimsagar	0.69	0.43	March 2006	In progress
Laxminarayanbari	0.70	N.A.	March 2006	Yet to commence
Durgabari	0.63	N.A.	March 2006	Yet to commence

(ii) Performance of projects:

Project name	Findings
Dimsagar lake	• The project envisaged activities like building of a pathway, retaining wall, drain, weeding, desilting, sitting arrangement, fencing, landscaping etc. • The project was scheduled to be completed by March 2006 but it was still in progress. • The project was delayed due to encroachment of the east, west and north banks of the lake by unauthorized occupants but no records showing steps taken to evict the unauthorized occupants and the extent of encroached land was made available to Audit. • 85 *per cent* of the total expenditure till date had been incurred on beautification and landscaping works and rest 15 *per cent* was incurred on measures to control pollution. • Further instead of awarding the contract for the project to a single contractor, the Executive Engineer of Agartala Municipal Corporation split the work of Dimsagar Lake into small groups, each costing less than ₹ 30,000 each and awarded the contracts without inviting tenders. This was also contrary of Monitoring Committee's recommendation to award the tender to technical firms by inviting tenders. As such, the decision to award contracts without bidding was against provisions of GFR.
Laxminarayanbari and Durgabari lake	• Comparison with other lakes showed that Laxminarayanbari was not as polluted as other lakes in Tripura. • Activities for restoration of Laxminarayanbari and Durgabari lake envisaged construction of pathway, weeding, desilting, seating arrangement, fencing, landscaping, building of toilets etc.

- The activities envisaged in the DPR could not commence due to the fact that a heritage building (royal palace of erstwhile kings' of Tripura) was in close proximity of the lakes and experts had suggested that re-excavation and dredging of these water bodies might cause severe damage to the heritage building. This also points to the fact that the State government did not carry out a comprehensive survey before initiating the programme which would have indicated the feasibility of taking up projects relating to these two lakes.

As such, despite the scheduled completion date of March 2006, the project for restoration and conservation of Laxminarayanbari and Durgabari lakes had still not commenced.

Thus, restoration and conservation of Dimsagar, Laxminarayanbari and Durgabari lakes had not taken place as envisaged as these projects were still incomplete.

Untreated sewage flowing into Dimsagar lake

Durgabari Lake

Laxminarayanbari Lake

5. Monitoring of programmes for control of water pollution

5.1 NLCP

By Inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
1 out of 3 projects	0 out of 3 projects	0 out of 3 projects	0 out of 3 projects

5.2 Ground water

Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
No information	No information	No information	No information

6. Outcomes

6.1 NLCP

Since the activities to restore and clean up Laxminarayanbari and Durgabari lake did not begin, no conclusions can be drawn about its impact on improving the quality of water in the lakes selected under NLCP. Further, despite spending ₹ 0.43 crore, the objective of restoration of Dimsagar lake could not be achieved.

State: Uttar Pradesh

1. Background

Uttar Pradesh has main rivers namely Ganga and Yamuna. Some of the other rivers that flow in Uttar Pradesh are Ramganga, Gomti and Ghaghara. Some of the lakes in Uttar Pradesh are Keetham Lake, Belasagar Lake, Barua Sagar Tal, Bhadi Tal, Nachan Tal, Mansiganga Lake, Sheikha Jheel etc. According to Central Ground Water Board, annual replenishable ground water resource in Uttar Pradesh is 76.35 Billion Cubic Meters (BCM) while the net annual ground water availability is 70.18 BCM. Ground water in 37 blocks is over-exploited, in 13 blocks it is critical and in 88 blocks it is semi-critical. Ground water in Uttar Pradesh is contaminated by salinity, fluoride, chloride, iron, nitrate and arsenic.

Test checked rivers and lakes in Uttar Pradesh

Insitutional arrangements in the State: As per information provided by MoEF, the Urban Development Department was a nodal Department and the UP Jal Nigam was the implementing agency in the State for NRCP. Uttar Pradesh Jal Nigam is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Uttar Pradesh is discussed below:

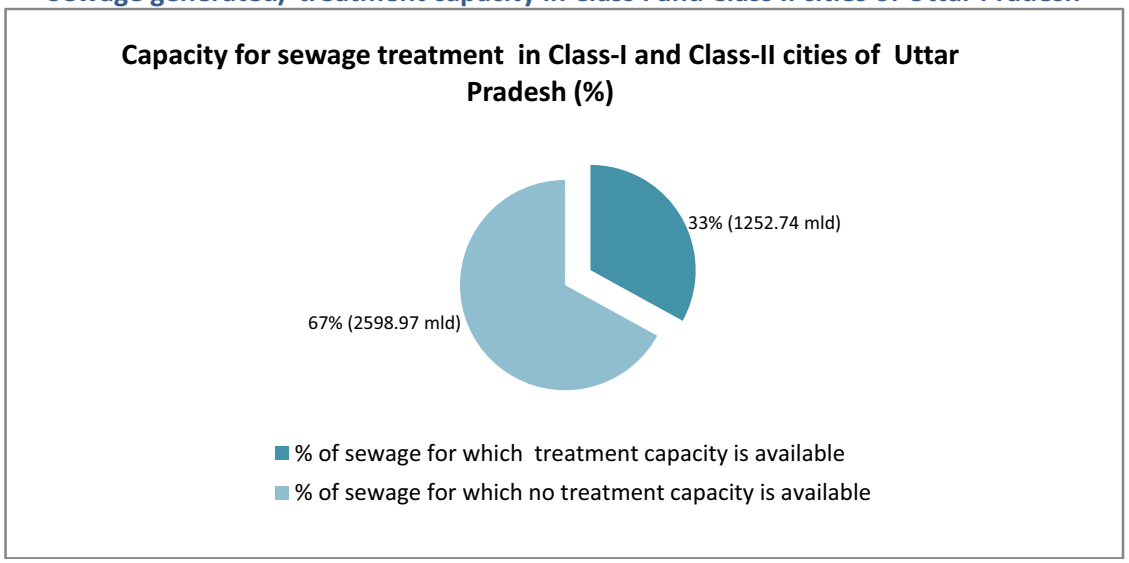
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Could not be verified	Could not be verified	Not Done
2. Assessment of water quality	**a) According to chemical Indicators**	Not Done	Could not be verified	Not Done
	b) According to Biodiversity indicators	Not Done	Not Done	Not applicable
	c) Quantification of contaminants	Not Done	Not Done	Could not be verified
	d) Assessment of impact of human activities	Not Done	Could not be verified	Could not be verified
3. Identification of risks to environment and health	**a) Risks to wetlands**	Could not be verified	Could not be verified	Not applicable
	b) Risks to aquatic species	Could not be verified	Could not be verified	Not applicable

	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Could not be verified	Could not be verified	Could not be verified
5. Programmes for prevention and control of water pollution		Could not be verified	Could not be verified	Could not be verified
6. Constitution of Water Quality Review Committee		Done		

[Note: Not applicable : Does not pertain to Ground Water; Could not be verified: Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Uttar Pradesh



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Uttar Pradesh is 3851.71 mld, of which treatment capacity is available for only 1252.74 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Ganga, Yamuna and Gomti rivers had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects are being implemented in 23 cities[34] viz., 257 projects in these 23 towns were sanctioned under NRCP out of which 216 were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 914.66 crore. **14 projects[35] being implemented under NRCP at a cost of ₹ 404.08 crore were test checked for detailed examination.**

(i) Physical and financial progress

[34] Agra, Allahabad, Anupshaher, Bijnor, Chunar, Etawah, Farrukkabad, Garhmukteshwar, Ghaziabad, Ghazipur, Jaunpur, Kanpur, Lucknow, Mathura, Mirzapur, Mughal Sarai, Muzaffarnagar, Noida, Saharanpur, Saidpur, Sultanpur, Varanasi and Vrindavan

[35] Six projects on Ganga river, four on Yamuna and four on Gomti river

Name of the river/ location	Name of the Project	Sanctioned cost (₹ in crore)	Actual expenditure (₹ in crore)	Sanctioned date of completion	Actual project end date
Yamuna at Ghaziabad	STP Cis Hindon Area	16.60 revised to 17.78	18.63	March 1999	November 2002
	STP trans Hindon Area	15.11	15.12	March 1999	November 2002
	I&D in Ghaziabad	2.69	2.69	December 2002	January 2003
	LCS at Ghaziabad	2.52	2.11	March 2002	March 2002
Ganga at Kanpur	Intermediate Pumping Station Munsi Punwa P-III	7.96 revised to 12.71	9.15	June 2003 Extended to March 2011	Not commissioned
	Intermediate Pumping Station at Rakhimandi	9.38 revised to 18.74	15.19	June 2003 Extended to January 2009	Not commissioned
	Relieving sewer for Bakermandi to Rakhimandi	5.90 revised to 10.81	14.85	October 2001	Ongoing
	SWM Part II	2.86	2.59	September 2004	September 2007
	MPS & Campus Development	18.58 revised to 37.37	16.31	September 2007	Not yet complete
	I & D of Ganda Nala and Halwa Khanda at Pandu /Ganga	10.50 revised to 15.21	13.89	August 2005 Extended upto March 2010	Not yet complete
Gomti / Lucknow	STP at Daulatganj	14.05	14.60	August 2003	January 2002
	STP USAB	104.22 revised to 169.71	138.81	March 2007 Extended upto July 2010	January 2011
	I&D of GH Canal Drain	31.42	27.64	March 2007	January 2011
	MPS at Gwari Culvert	30.10 revised to 53.10	39.98	March 2007 Extended upto June 2010	January 2011

(ii) Performance of the projects

(a) Kanpur

The average sewage generated in the city of Kanpur is 426 mld. However, only 162 mld is treated and the rest 264 mld is discharged into the Ganga. 23 drains were required to be intercepted against which 19 drains were intercepted and the remaining four drains were yet to be intercepted for treatment. **Details of six projects test checked in Kanpur which aimed to improve the quality of water in Ganga are discussed below:**

Project name	Findings
Intermediate Pumping Station at Munsipunwa,	• The project was originally scheduled for completion by June 2003 but was extended upto March 2011. All the major works under the project were completed but the commissioning had been postponed due to non completion of STP at Bingawan.

Kanpur	• The project was delayed due to non-construction of over-bridge adjoining to pumping station and non-availability of permission of road cutting for laying rising main/sewer line on the road.
Intermediate Pumping Station at Rakhimandi, Kanpur	• The project was originally scheduled to be completed by June 2003 but it was actually extended upto January 2009. All the major works under the project were completed but the commissioning had been postponed due to non completion of STP at Bingawan. • The project was delayed due to delay in possession of land from railways, encroachment and non-grant of permission by railways for laying the rising main under the Juhi Railway Bridge.
Relieving Sewer from Bhikermandi to Rakhimandi	• The project scheduled for completion by October 2001 was continuing as of December 2010 without any extension of time. • There was a cost overrun of ₹ 8.95 crore which was due to faulty alignment and nine gaps of length of 1000 metres. • The project was delayed due to non-acquisition of land, delay in finalization of tendering process and re-alignment of sewer passing through busiest road/narrow lanes/lanes having multistoried buildings. • Only three drains were intercepted out of five drains.
Main Pumping Station & Campus Development	• The project scheduled for completion by September 2007 was continuing without any extension. • The project was delayed due to non-availability of land and delay in tendering. The land could be acquired in October 2006 and possession was taken in December 2006.
Solid waste Management (SWM) Part II)	• The project was completed in September 2007, after a delay of three years. • The project was delayed due to delay in finalization of tender. • It could not be verified whether the project had been assessed by the State on basis of set targets/ performance milestones.
Roof of Ganda Nala and Halwa Khanda Nala	• The project was scheduled for completion by August 2005 but was extended upto March 2010. However, it was not yet complete. • There was a cost overrun of ₹ 3.39 crore due to increase in labour and material costs.

(b) Ghaziabad

The daily average sewage generated in the city of Gaziabad is 290 mld but only 129 mld of sewage is treated and the remaining 161 mld of untreated sewage was discharged into the river Hindon which confluences with river Yamuna. **The details of four test checked projects being implemented at Ghaziabad city with the aim to improve the quality of Yamuna's water are discussed below:**

Project name	Findings
STPs at Cis Hindon Area	• The project was completed in November 2002, after a delay of three years and eight months. • There was cost overrun of ₹ 2.03 crore.

	• The project was delayed due to non –availability of land. • The STP was not functioning as per prescribed standards as a result of which the entire untreated sewage was discharged into river Yamuna/Hindon defeating the purpose for which it was constructed. • Further, it was envisaged in the DPR that electricity would be generated from biogas from the STP. However, this was also not happening due to non-functioning of gas holder, gas scrubbing system and power generation units of the plant. **As such, the STP totally failed to meet its objectives**.
STP Trans Hindon Area	• The project was completed in November 2002, after a delay of three years and eight months. • The project was delayed due to non –availability of land. • It was observed that the STP was not functioning as per prescribed standards of SPCB as a result of which the entire untreated sewage was discharged into river Yamuna/Hindon defeating the purpose for which it was constructed. • Further, it was envisaged in the DPR that electricity would be generated from biogas from the STP. However, this was also not happening due to non-functioning of gas holder, gas scrubbing system and power generation units of the plant. **As such, the STP totally failed to meet its objectives**.
Interception and Diversion work at Ghaziabad	• The project was completed in January 2003 after a delay of one month. • The total length of sewer lines laid under the project was 7.72 Km against the original planned 7.93 Kms. • The project had been handed over to the local bodies but no evidence was found to indicate whether it was carrying out preventive maintenance and periodic cleaning of the sewer lines laid.
Low Cost Sanitation at Ghaziabad	• The project was completed in March 2002 on time. The final Utilization Certificate was submitted only in January 2004. • The project envisaged construction of 48 units of LCS, however, only 39 were built. The project had been handed over to Nagar Nigam which was carrying out the O&M of all 39 units through NGOs and Sulabh International. However, no supporting documents were furnished.

(c) Lucknow

The average daily sewage generated in Lucknow town is 410 mld against which on an average 300 mld of sewage is treated. As a result, 110 mld of untreated sewage daily flows into Gomti river. 26 drains from Lucknow town open into the Gomti river but only nine have been intercepted. The civil and electrical works of remaining drains had been completed but the interception and diversion work of these drains could not be put to use due to non-

commissioning of rising main of Kukrail Pumping Station. **All of the four projects test checked under Lucknow which aim at improving the quality of water of Gomti River are discussed below:**

Project name	Findings
STP Daulatganj	• The project was completed in January 2002 on time. • There was a cost overrun of ₹ 0.55 crore for which reasons could not be ascertained. • The STP was not being utilised at its full capacity and was treating only 34 mld of sewage against designed capacity of 42 mld due to non-construction of two drains and resultant blockage of drains. UP Jal Nigam had not initiated any action to rectify the problem. Further, the treated sewage did not meet the standards prescribed by NRCD.
STP USAB	• The project has been completed in January 2011 after a delay of three years and ten months. • There was a cost overrun of ₹ 34.59 crore. • The time and cost overrun of the project was attributable to delay in acquisition of land and the land was acquired in July 2008 after the expiry of completion date of the project.
Interception and Development of GH Canal Drain	• The project completed in January 2011 after a delay of three years and ten months. • The project was delayed due to delay in acquisition of land for construction of pumping station and change in alignment of rising main.
MPS at Gwari Culvert	• The project was completed in January 2011 after a delay of three years and ten months. • There was a cost overrun of ₹ 9.88 crore. • The project was delayed due to problems in acquisition of land and delay in tendering process. • An advance payment of ₹ 50 lakh was paid to contractor in September 2006 which was not adjusted even after a lapse of four years.
As such, projects sanctioned under NRCP in Kanpur, Ghaziabad and Lucknow for control of pollution of Ganga, Yamuna and Gomti could not achieve the desired objectives.	

Incomplete Intermediate Pumping Station at Munsipurwa, Kanpur

Incomplete STP 2.76 mld (WSP technique) at Mathura

4.2 NLCP

(i) Physical and financial progress

Only one lake conservation project relating to Mansi Ganga lake was included under NLCP.

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Mansi Ganga	22.71	16.37	March 2009	On going

(ii) Performance of project:

Project name	Findings
Mansi Ganga	• The activities envisaged for restoration and conservation of Mansi Ganga lake involved construction of an STP, Low cost Sanitation, de-weeding, de-silting, lake front development and afforestation. • The project was scheduled for completion by March 2009 but it was still ongoing. • An expenditure of ₹ 16.37 crore was incurred on the project as of November 2010. • The delay was due to non release of funds by NRCD, in obtaining permission from Forest Department, laying of rising main and land acquisition for STP. • 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 eight out of the planned ten LCS units/toilet blocks have been completed till November 2010 as land was not available for remaining two. With respect to lake front development, audit scrutiny showed that work under this component has not yet started. With respect to afforestation, only 40 *per cent* of the work under this component has been completed till November 2010. **As such, the objective of restoration and conservation of Mansi Ganga lake had not yet been achieved.**

Temple sewage & solid waste entering in Mansi Ganga Lake

Stored storm water mingled with sewage enters into Mansi Ganga Lake through inlet

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
0 out of 14 projects	0 out of 14 projects	0 out of 14 projects	0 out of 14 projects

5.2 NLCP

By Inter-Departmental Coordination Committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
0 out of 1 projects	0 out of 1 projects	0 out of 1 projects	0 out of 1 projects

5.3 Ground water (in six blocks test checked)

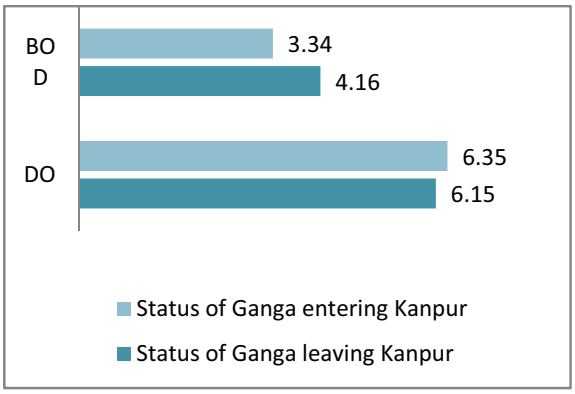
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
No	No information	4 out of 6	No information

Testing and monitoring agency (SPCB) of the state was unaware of arsenic content in ground water till the School of Environmental Studies Jadhavpur University Kolkata traced arsenic in water in Ballia district in it's study, in 2003. Jal Nigam had identified 1225 habitations effected from fluoride in 1994 in district Unnao. Jal Nigam conducted test and survey of arsenic effected habitations in 2004 with help of UNICEF and identified 310 habitations in district Ballia and 165 habitations in district Lakhimpur Kheri.

6. Outcomes

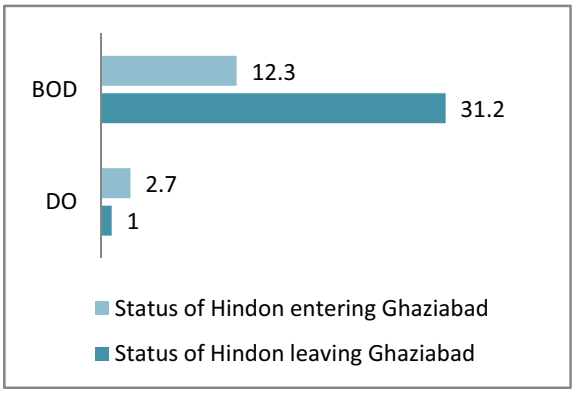
6.1 NRCP

(a) Water quality in Ganga after Kanpur



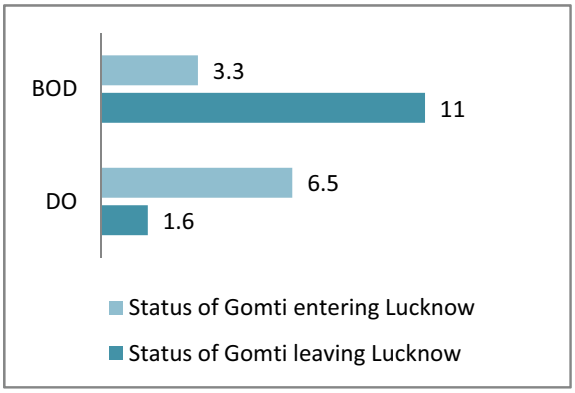
Status of Ganga on entering Kanpur and after leaving Kanpur in terms of DO, BOD and TC is shown in the chart alongside. Both the BOD and TC rise enormously after the Ganga leaves Kanpur, with TC rising by almost 1434 *per cent*. This highlights the inadequate sewage treatment facilities in Kanpur city. BOD was almost 1.4 times the criteria in Ganga river after Kanpur, indicating high levels of organic pollution. Further, the TC was 86 times the criteria, indicating that Ganga, after leaving Kanpur, was full of disease causing, fecal-related bacteria, viruses and protozoa which cause illness.

(b) Water quality in Hindon after Ghaziabad



Status of Hindon entering and leaving Ghaziabad in terms of DO and BOD is shown in the chart opposite. It can be observed that the Dissolved Oxygen decreased whereas BOD was increased by 153 per cent. Further, TC increased from 120000 to 210000, a rise of 75 per cent by the time Hindon left Ghaziabad. BOD was more than 10 times the criteria in Hindon river, indicating high levels of organic pollution. Further, the DO was less than the criteria indicating insufficient oxygen being available for survival of aquatic life. Further, the TC was 420 times the criteria, indicating that Hindon, after leaving Ghaziabad, was full of disease causing, fecal-related bacteria, viruses and protozoa which cause illness.

(c) Water quality in Gomti after Lucknow



Status of quality of water, in terms of DO and BOD, in Gomti while entering and leaving Lucknow are shown in the chart opposite. It can be observed that while leaving Lucknow, DO decreased significantly whereas BOD and TC increased by 233 per cent and 3155 per cent. BOD was more than 3.6 times the criteria in Gomti river, after Lucknow, indicating high levels of organic pollution. Further, the DO was less

than the criteria indicating insufficient oxygen being available for survival of aquatic life. Further, the TC was 280 times the criteria, indicating that Ganga, after leaving Lucknow, was full of disease causing, fecal-related bacteria, viruses and protozoa which cause illness.

Projects sanctioned under NRCP in Kanpur, Ghaziabad and Lucknow for control of pollution of Ganga, Yamuna and Gomti could not achieve the desired objectives and

6.2 NLCP

As the project on improving water quality of Mansi Ganga lake was still in progress, no conclusions could be drawn about impact of NLCP in restoring the lake.

State: Uttarakhand

1. Background

Some of the important rivers in Uttarakhand are Ganga, Yamuna, Bhagirathi, Kali, Gori, Alaknanda, Kosi, Saryu, Bhilangana etc. Some of the important lakes in Uttarakhand are Bhimtal Lake, Dodital, Kedartal, Nainital lake, Roopkund, Panna Tal, Satopanth Tal, Sattal etc. According to Central Ground Water Board, the annual replenishable ground water resources in Uttarakhand was 2.27 Billion Cubic Meters (BCM) and the net annual ground water available was 2.10 BCM. Out of 95 blocks, only two blocks in Uttarakhand were over-exploited and three blocks were semi-critical with respect to ground water. The only ground water contaminant was nitrate which affected ground water in parts of the districts of Dehradun, Haridwar and Udhamsinghnagar.

Rivers and lakes test checked in Uttarakhand

Insitutional arrangements in the State: As per information provided by MoEF, Uttaranchal Peyjal Nigam, Government of Uttrakhand is the nodal department for NRCP and the implementing agency was Uttarakhand Peyjal Nigam. Nainital Lake Region Special Area Development Authority (NLRSADA) is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of Uttarakhand is discussed below:

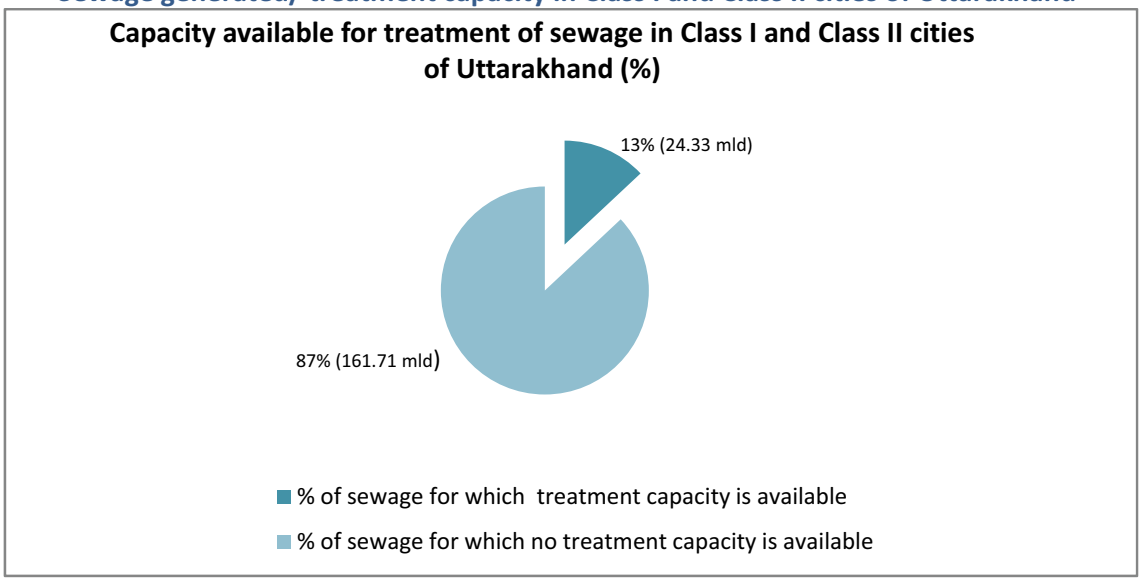
		Rivers	Lakes	Ground water
1. Preparation of inventory of water resources		Not Done	Not Done	Not Done
2. Assessment of water quality	**a) According to chemical Indicators**	Done	Done	Done
	b) According to Biodiversity indicators	Not Done	Done	Not applicable

	c) Quantification of contaminants	Partially (Nutrients: Not Done, Pathogenic organism: Done, Human produced chemicals:Not Done)	Partially (Nutrients: Not Done, Pathogenic organism: Done, Human produced chemicals: Not Done)	Could not be verified
	d) Assessment of impact of human activities	Partially (Industry: Done)	Not Done	Not Done
3. Identification of risks to environment and health	**a) Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c) Risks to human health	Not Done	Not Done	Not Done
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Not Done	Not Done	Not Done
6. Constitution of Water Quality Review Committee		Not Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of Uttarakhand



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of Uttarakhand is 186.04 mld, of which treatment capacity is available for only 24.33 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

River Ganga had been selected for pollution abatement projects under the National River Conservation Programme (NRCP) in Uttarakhand. Projects are being implemented in 10 cities[36] viz. 44 projects in these 10 cities were sanctioned under NRCP out of which 37 were completed as of March 2010. The total sanctioned cost of all the projects was ₹ 70.62 crores. Nine projects being implemented under NRCP at a cost of ₹ 48.34 crore were test checked for detailed examination.

(i) Physical and financial progress

Name of the river/ location	Name of the Project	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Ganga/ Haridwar-Rishikesh	I&D & STP works at Lakhshman Jhula and Swarg Ashram	4.53	3.47	October 2009	Not completed
	STP at Bhopatwala	6.13	2.40	October 2009	Not completed
	Enhancement of capacity & replacement Gravity Main	11.70	11.73	October 2009	January 2010
	Enhancement of STP at Jagjeetpur at Haridwar	15.99	13.36	October 2009	July 2010
Ganga/ Srinagar	I&D Part I (Alaknanda)	2.65	2.65	December 2003	May 2004
	STP 3.50 mld (Alaknanda)	1.61	3.50	January 2006	January 2009
Ganga/ Uttarkashi	STP Part I (Bhagirathi)	0.88	0.88	February 2004	March 2010
	I&D Part I (Bhagirathi)	3.67	4.98	May 2004	September 2009
	I&D Part II (Bhagirathi)	1.18	1.85	December 2003	December 2009

(ii) Performance of the Projects

(a) Rishikesh

The average estimated sewage generated in the city of Rishikesh was 2.6 mld. Though three mld sewage treatment capacity existed in the city, only 1.70 mld was being treated and the rest 0.90 mld was being discharged into the Ganga. Out of 24 drains falling into the river Ganga, 23 have been intercepted and one has yet to be intercepted which is responsible for the 0.90 mld of sewage being discharged into the river Ganga.

(b) Haridwar

[36] Badrinath, Devprayag, Gopeshwar, Haridwar & Rishikesh, Joshimath, Karnaprayag, Ranipur, Rudraprayag, Srinagar and Uttar Kashi

The average estimated sewage generated in the city of Haridwar was 53.09 mld. Though 53 mld sewage treatment capacity existed in the city, only 51 mld was being treated and the rest 2.09 mld was being discharged into the Ganga. Out of 21 drains falling into the river Ganga, 17 have been intercepted and four have yet to be intercepted**. Details of the cities test checked under NRCP are discussed below:**

Project name	Findings
I&D and STP works at Lakhshman Jhula and Swarg Ashram in Rishikesh on river Ganga	• The project scheduled for completion by October 2009 but was not yet complete. • The project was delayed due to public hindrance.
STP at Bhopatwala in Haridwar on river Ganga	• The project scheduled for completion by October 2009 was not yet complete. • The project was delayed due to non-transfer of land from UP Irrigation Department. • Due to the project not taking off as yet, it was observed that the I&D work at Loknath Nala at Bhopatwala (Sanctioned cost Rs. 4.48 crore) was affected.
Enhancement of capacity & replacement Gravity Main in Haridwar on river Ganga	• The project was completed in January 2010 after a delay of three months. The completion report of the project and the final UCs of the project have not yet been sent to MoEF. • The project was delayed due to delay in permission for land from local residents. • Under the project, 8.56 kms of pipe were laid as against the target of 8.06 kms. One pumping station was also replaced and the pumping station was being utilised fully.
Enhancement of STP at Jagjeetpur at Harid at Haridwar on river Ganga	• The project was completed in July 2010 after adelay of nine months. The completion report and final UCs have not yet been submitted to MoEF. • The project was delayed due to late award of contract. • STP of capacity 27 mld was built and 27 mld of sewage was being treated. Further, monthly sampling was being done by State Pollution Control Board.

(c) Srinagar

The average estimated sewage generated in the city of Srinagar was 3.50 mld flowing out from eight tapped drains and for remaining 11 un-tapped drains, no data was available. Total sewage flowing through eight tapped drains was being treated and the rest sewage from the 11 untapped was being discharged into the Alaknanda As such, there would be untreated sewage being discharged from these drains which have not yet been intercepted. **Details of two projects test checked in Srinagar which aim to improve the quality of Alaknanda water are discussed below:**

Project name	Findings
I&D Part I at Srinagar on river Alaknanda[37]	• The project was completed in May 2004 after a delay of five months. The completion report and final UCs have not yet been submitted to MoEF. • Though the project was completed within the allotted funds, it was observed that ₹ 7.61 lakh was incurred on un-approved items. • The project was delayed due to time extension sought by the contractor • 8 drains were intercepted under this project and 5.76 kms of pipes laid, against targeted 4.49 kms.One pumping station was also built and its capacity was being fully utilised
STP 3.50 mld Srinagar on river Alaknanda	• The project was completed in January 2009 after a delay of three years. The completion report and final UCs have not yet been submitted to MoEF. • The cost overrun on the project was ₹ 1.89 crore. • The project was delayed due to delay in release of funds and tender process. • The STP capacity created was 3.50 mld and it was treating 3.50 mld.However, it was observed that untreated sewage was still flowing into the river Alaknanda but its exact amount had not been measured.The treated sewage was meeting the prescribed standards in relation to pH, Total Suspended solids (TSS), BOD and COD.

(d) Uttarkashi

The average estimated sewage generated in the city of Uttarkashi was 2.25 mld and only 0.25 mld capacity for treatment was available in Uttarkashi but no sewage was actually being treated due to the fact that none of the STPs constructed were operational. As a result, the entire 2.25 mld of sewage being generated in Uttarkahi was flowing untreated into the Bhagirati. As such, there would be untreated sewage being discharged from these drains which have not yet been intercepted. **Details of three projects test checked in Uttarkashi which aim to improve the quality of Bhagirathi water are discussed below:**

Project name	Findings
STP Part I in Uttarkashi on river Bhagirathi	• The project was completed in March 2010 after a delay of six years and one month. Completion report and final UC had not yet been submitted by the implementing agency to MoEF. • The project was delayed due to non availability of land.

[37] At Devprayag, Alaknanda meets Bhagirathi and renamed Ganga

	• The STP capacity created was 0.25 mld but actually no sewage was being treated because the sewer line was not connected to the STP.
I&D Part I	• The project was completed in September 2009 after a delay of five years and four months. Completion report and final UC had not yet been submitted by the implementing agency to MoEF. • The cost overrun on the project was ₹1.31 crore due to change in design structure of the project by executing unapproved works. Further, ₹ 49.97 lakh was incurred on un-approved items. • The project was delayed due to resistance by local residents over use of their land for construction work. • The performance of the project had not been assessed by the implementing agency due to non completion of STP-II. Even though under the project one pumping station was built, it was not being utilised. • As such, the entire project was lying unutilized at present.
I&D Part II	• The project was completed in December 2009 after a delay of six years. The completion reports and final UCs have not yet been submitted by the implementing agency to MoEF. • The cost overrun on the project was ₹ 0.67 crore due to change in design structure of the project by executing unapproved works. Further, ₹ 9.82 lakh was incurred on un-approved items. • The project was delayed due to resistance by local residents over use of their land for construction work. • The performance of the project had not been assessed by the implementing agency due to non-completion of STP-II. Two pumping stations were constructed but these were not being utilised at present due to non-completion of STP II. • As such, the entire project was lying unutilized at present.

Thus, the projects sanctioned for prevention of pollution of Alaknanda/Ganga river in cities of Srinagar and Rishikesh-Haridwar were working as envisaged. However, projects sanctioned for prevention of pollution of Bhagirathi in Uttarkashi had not met their objectives.

Untrapped drain in Srinagar

Untreated sewage flowing into Ganga in Haridwar

4.2 NLCP

5 lakes in Uttarakhand, Bhimtal, Naukuchiatal, Sattal, Khurpatal and Nainital had been included under NLCP for conservation and restoration. Out of these five lakes, works undertaken for conservation and restoration of Nainital lake were test checked for detailed audit scrutiny. It was observed that none of these lakes figured in the list of most polluted lakes prepared by NRCD.

(i) Physical and financial progress

Name of the lake	Sanctioned cost (₹ in crore)	Actual Expenditure (₹ in crore)	Scheduled date of completion	Actual date of completion
Nainital lake	47.97	47.97	August 2006	March 2007 (but not yet completed)

(ii) Performance of the Project:

Project name	Findings
Nainital Lake	• NRCD, MoEF in 2003 had sanctioned a project for conservation and management of Nainital Lake at a total cost of ₹ 47.96 crore on 70:30 basis between GOI and State government. • For effective implementation of project, the Project monitoring Committee (PMC) had been constituted by government Of Uttarakhand under the Chairmanship of Commissioner, Kumaon Division. The Lake Development Authority (LDA) was assigned to be the nodal agency for coordinating various works under the project. The PMC entrusted different works to the different government departments/ agencies and private agencies.

The main works under the Naini Lake conservation project were as under:

1. Sewage management			
1.1 Sewer lines and Sewage treatment Plant: Branch lines , STPs			
1.2 Construction of community toilets in the catchment area: Community toilets (29)			
1.3 Solid waste management: Mission Butterfly launched by Solid waste Management for mobilising the community. Manage waste in a sustainable way, optimising recycling and reuse.			
2. Hydraulic Works			
2.1 Outlet works of lake at Tallital	2.2 Protection works at Balia Nala: Bed protection measures, Control measures for stabilisation of landslides, Repair and renovation of drains, Construction of toe walls, check walls etc, Vegetative turfing on the sliding slope		
3. Conservation and Development works			
3.1 Aeration works	3.2 Dredging of deltas: removal of silt	3.3 Bio-manipulation works: Removal of Gambusi, Puntius, Big head carp, Mahseer and silver carp introduced	3.4 Shore line development: jetty, paving of flat area, development of parks, renovation and beautification of Thandi Sadak, renovation of railing and wall and lighting and street furniture

4. Catchment Conservation Works		
4.1 Catchment Conservation Works: Vegetational remedial, Engineering remedial and eradication of Loranthus	4.2 Other conservation works: Renovation of lake retaining wall	
5. Water Conservation and infrastructure facilities		
5.1 Water Quality monitoring: checking of water quality parameters	5.2 Parking	5.3 New bridge cum bypass
6. Public participation and awareness creation for lake conservation • Awareness through print media and electronic media, Launching of lake warden scheme, Talk show, Workshop under Solid Waste Management		

Results and Benefits of the Project: After completion of the different works, the achievements were as under:

- Transparency of the lake has increased
- Decrease in concentrations of toxic gases like carbon dioxide, ammonia, hydrogen sulphide and methane
- Decease 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/lt to 6.8 mg/lt 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.

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
8 out of 9 projects	8 out of 9 projects	8 out of 9 projects	0 out of 9 projects

5.2 NLCP

By Inter-Departmental Coordination Committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
1 out of 1 projects	1 out of 1 projects	1 out of 1 projects	1 out of 1 projects

5.3 Ground water (in six blocks test checked)

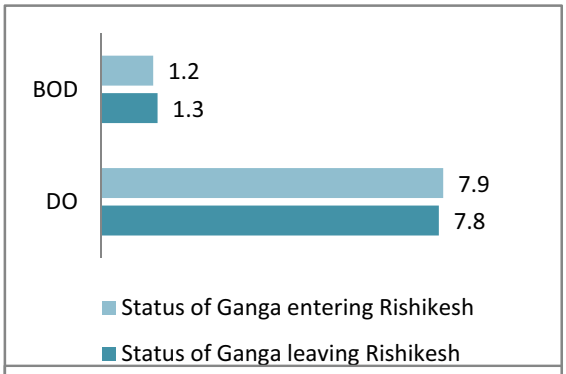
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	Yes	Not Done, except in Dehradun and Nainital.	Yes (Partially)

6. Outcomes

6.1 NRCP

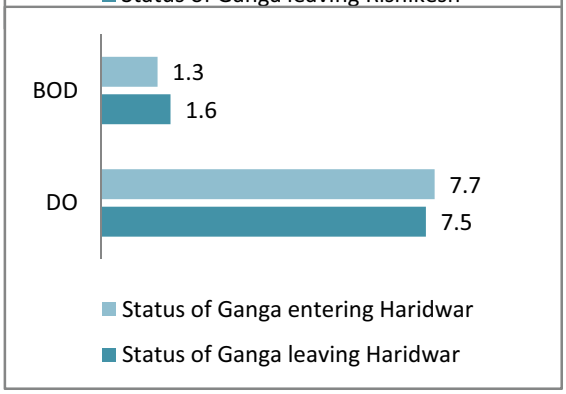
(a) Water quality in river Ganga after Rishikesh

Status of Ganga on entering Rishikesh and after leaving Rishikesh in terms of DO and BOD is shown in the chart alongside. TC of Ganga rises from 220 MPN/100 ml to 250 MPN/100 ml after it leaves Rishikesh.



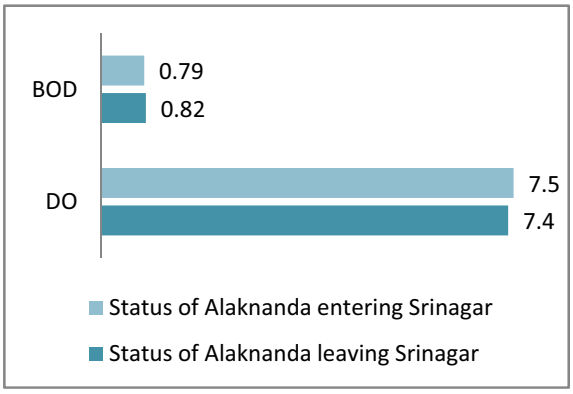
(b) Water quality in river Ganga after Haridwar

Status of Ganga on entering Haridwar and after leaving Haridwar in terms of DO and BOD is shown in the chart alongside. TC of Ganga rises from 280 MPN/100 ml to 500 MPN/100 ml after it leaves Haridwar.



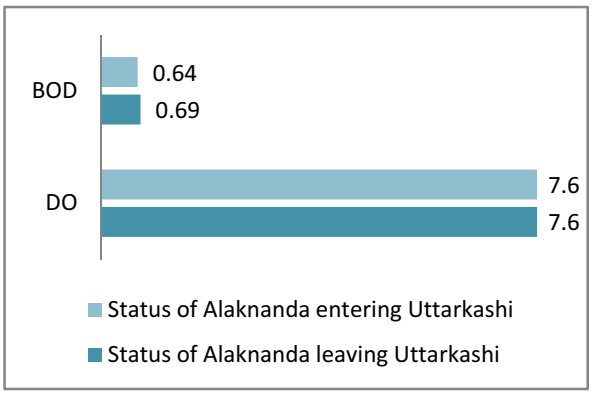
(c) Water quality in river Alaknanda after Srinagar

Status of Alaknanda on entering Srinagar and after leaving Srinagar in terms of DO and BOD is shown in the chart alongside. TC of Alaknanda rises to 40 from 32 when it leaves Srinagar.



(d) Uttarkashi

Status of Bhagirati on entering Uttarkashi and after leaving Uttarkashi in terms of DO and BOD is shown in the chart alongside. TC of Bhagirati rises to 36 MPN/100 ml from 28 MPN/100 ml when it leaves Uttarkashi.



6.2 NLCP

Though the project for restoration and conservation of Nainital Lake was not yet complete as a whole, the water quality report of December 2010 revealed that criteria for designated best use classification for B class water for all parameters was achieved.

State: West Bengal

1. Background

Ganga, Mahananda and Damodar are the important rivers of West Bengal. Some important lakes in West Bengal are Rabindra Sarobar, Rasikbil, Senchal lake, Sagar Dighi, Mirik lake, Mati jheel, Bhangzang Salamander Lake, Talberia etc. Out of 341 blocks in West Bengal, in one block the ground water is critical and in 37 blocks, the ground water is semi-critical. According to Central Ground Water Board, the annual replenishable ground water resource in West Bengal is 30.36 BCM and the net annual ground water availability is 27.46 BCM. Some of the contaminants present in ground water in West Bengal are salinity, fluoride, chloride, iron, nitrate and arsenic.

Test checked rivers and lakes in West Bengal

Insitutional arrangements in the State: As per information provided by MoEF, the Urban Development and Commerce & Industries Department, Government of West Bengal, Kolkata is the nodal department for NRCP and the implementing agency is Kolkata Metropolitan Development Authority, Kolkata and Industries Department. Department of Urban Development, Government of West Bengal is the implementing agency for NLCP.

2. Planning for water pollution

Action taken by the State in planning for programmes for the control of river, lake and ground water pollution in the State of West Bengal is discussed below:

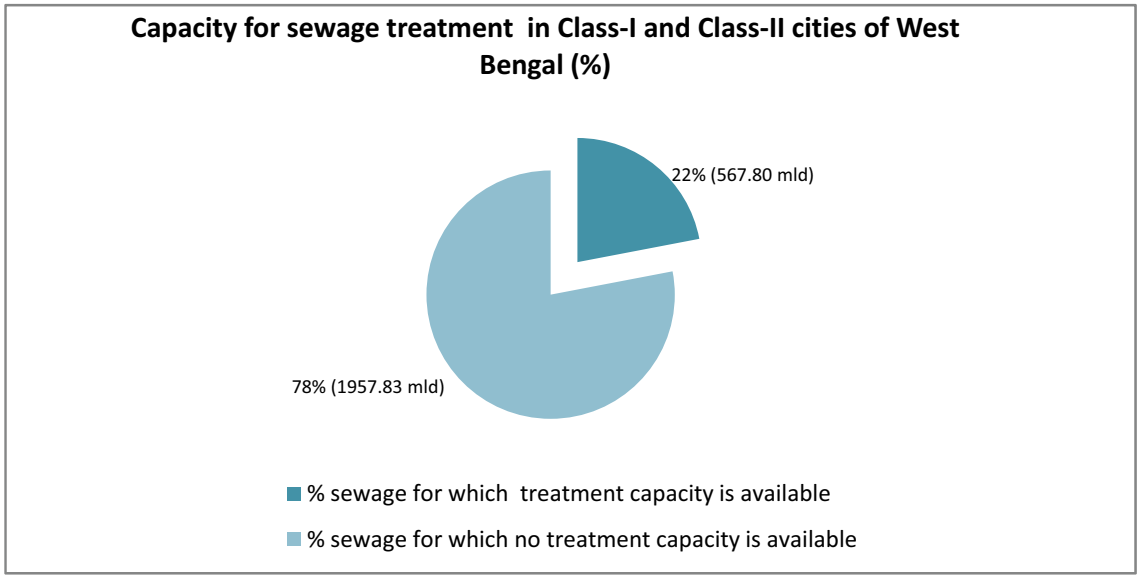
		Rivers	Lakes	Ground water
1. Inventory of water resources		Done	Done	Done
2. Assessment of water quality	a) Chemical Indicators	Done	Done	Done
	b) Biodiversity indicators	Done	Not Done	Not applicable
	c) Quantification of contaminants	Done	Done	Could not be verified
	d) Impact of human activities	Partially (Agriculture-Done.	Done	Partially (Mining-Not

		Industry-Done. Mining-Not Done. Dams-Not Done. Uncontrolled disposal of human waste-Done.)		Done)
3. Identification of risks to environment and health	**a)Risks to wetlands**	Not Done	Not Done	Not applicable
	b) Risks to aquatic species	Not Done	Not Done	Not applicable
	c)Risks to human health	Not Done	Not Done	Could not be verified
4. Policy for water pollution		Not Done	Not Done	Not Done
5. Programmes for prevention and control of water pollution		Not Done	Not Done	Not Done
6. Constitution of Water Quality Review Committee		Done		

[**Note: Not applicable:** Does not pertain to Ground Water**; Could not be verified:** Could not be verified on account of lack of evidence.]

3. Sewage generation and its treatment as per CPCB

Sewage generated/ treatment capacity in Class I and Class II cities of West Bengal



[Source: CPCB data, 2005-06]

The total sewage generated in Class I and Class II cities of West Bengal is 2525.63 mld, of which treatment capacity is available for only 567.80 mld.

4. Implementation of programmes for control of water pollution

4.1 NRCP

Ganga, Damodar and Mahananda rivers had been selected for pollution abatement projects under the National River Conservation Programme (NRCP). Projects are being implemented in 32 cities. 219 projects in these 32 cities were sanctioned with the cost of ₹ 377.39 crore.

10 projects being implemented under NRCP at an estimated cost of ₹ 56.60 crore were test checked for detailed examination

(i) Physical and financial progress

Name of the river/ location	Name of the project	Sanctioned cost (` in crore)	Actual Expenditure (` in crore)	Schedule date of completion	Actual date of completion
Ganaga/ Barrackpore	RFD at Kolkata	4.81	4.81	November 2008	November 2009
	Crematoria at Shantipur	0.83	1.15	July 2007	January 2010
	MPS I	2.00	1.64	August 2003	August 2009
	I&D	3.96	3.96	December 2004 extended upto March 2011	Ongoing
	RFD at Kamarahati	2.86	2.46	March 2009	September 2009
Ganga/ Gayeshpur, Halilshar & Kancharapara	MPS II	3.41	3.12	February 2004	June 2009
	I & D Sewer,Halishar, Kanchrapara, Gayeshpur	1.52	1.52	November 2002	March 2004
	Lifting Station I Southern Part	1.82	1.83	August 2003	April 2009
Mahananda/ Siliguri	I & D,MPS,STP and RFD	32.37	22.06	September 2007	Not completed
	RFD at Siliguri	3.02	3.00	May 2009	May 2009

(ii) Performance of the projects

(a) Barrackpore

The average sewage generated in the city of Barrackpore in 2001 was 24.30 mld. One STP existed in the city but no sewage was being treated and the entire 24.30 mld untreated sewage was being discharged into the Ganga.

Details of four projects test checked in Barrackpore which aim to improve the quality of Ganga's water are discussed below

Project name	Findings
RFD at Kolkata	• The project was completed in November 2009.after a delay of one year . • The project was sanctioned at an estimated cost of ₹ 4.81 crore • Operation and maintenance of the created assets was yet to be started and the assets created at a cost of ₹ 4.81 crore remained without any maintenance for last two years.
RFD at Kamarahati	• The project was completed in September 2009 after a delay of six months • An expenditure of ₹ 2.46 crore was incurred on the project against the sanctioned cost of ₹ 2.86 crore. • The project was delayed due to encroachment and Monsoon. • 250 meters of river front area was actually developed under the project. Assets created at a cost of ₹ 2.46 crore remained without any maintenance for last almost two years because Kolkata

	Metropolitan Development Authority (KMDA) did not receive the required funds.
Main Pumping Station I	• The project was completed in August 2009 after a delay of six years The project completion report along with final utilization certificate was yet to be submitted to NRCD. • An expenditure of ₹ 1.64 crore was incurred on the project. • The project was delayed due to non acquisition of land. • Two pumping stations having capacity of 6.9 mld were constructed under the project. However, these were not handed over to the Municipality for commissioning. Thus, the pumping station constructed at a total cost of ₹ 1.64 crore was lying idle.
Electric Crematoria	• The project was completed in January 2010 after a delay of two years and six months. • An expenditure of ₹ 1.15 crore was incurred on the project against the sanctioned cost of. ₹ 0.83 crore resulting in cost escalation of ₹0.32 crore. • The project was delayed due to change of location of the original site.
I&D	• The project was sanctioned in August 2002 with scheduled date of completion by December 2004. The duration of the project was extended upto March 2011. • The project was delayed due to legal issues in acquisition of land. • Due to non-completion of the I&D work, the Main Pumping Station, constructed at a cost of ₹ 1.64 crore, could not be commissioned.

(b) Siliguri

The average daily estimated sewage generated in **Siliguri** is 59 mld and the entire untreated sewage is let into Mahananda river. There are 350 drains falling into Mahananda river and none of them has been intercepted.

Two projects test checked in Siliguri are discussed below:

Project name	Findings
I&D at Siliguri	• The project scheduled for completion by March 2007 was not yet complete. • The project was delayed due to non-availability of land.
STP at Siliguri	• The project was scheduled for completion by September 2007, was not yet complete • The project was delayed due to non-availability of land.
RFD	• The project scheduled for completion by April 2007 was not yet complete. • The project was delayed due to non-availability of land.
MPS	• The project scheduled for completion by October 2006 was not yet complete.
River Front Development	• The project was completed in May 2009. • An expenditure of ₹ three crore was incurred on the project

at Siliguri	against a sanctioned cost of ₹ 3.02 crore. • 8.7 kilometer river front area was developed under the project and the river front areas were being maintained properly.

(c) Gayespur/Halilshar

The average daily estimated sewage generated in Gayespur/Halilshar is 38 mld. STP capacity of 12.5 mld is available in the city but no sewage is treated and the entire untreated sewage is let into River Hoogly. No Information was available regarding the quality of River Ganga before it enters Gayespur/Halilshar and after it leaves Gayespur/Halilshar.

Projects test checked under Gayespur/Halilshar which aim at improving the quality of water of Ganga River are discussed below:

Project Name	Findings
MPS-II, Halilshar, Kanchrapara, Gayespur	• The project was completed in June 2009 after a delay of five years and four months. • An expenditure of ₹ 3.12 crore was incurred on the project against a sanctioned cost of ₹ 3.41 crore. • The project was delayed due to delay in acquisition of land. • Pumping stations having capacity of 6.5 mld was constructed under the project.
Lifting Station (I&D sewer) Halilshar/ Kanchrapara/ Gayespur	• The project was completed in March 2004 after a delay of one year and four months but the project has not yet been commissioned. • The project was delayed due to non-availability of site, poor sub soil condition for laying sewers and shifting of utility services and narrow width of the road. • The pumping stations having capacity of 6.5 mld was constructed under the project and against the total length of 3233 meters of sewer lines, only 1934 meters sewer line was laid under the project.
LS-I Halisahar, Kanchrapara, Gayespur	• The project was completed in April 2009 after a delay of five years and eight months but the project has not yet been commissioned. • The project was delayed due to delay in acquisition of land. • Under the project, pumping stations having capacity of 6.5 mld was constructed and against the total length of 3233 mtrs sewer lines planned, only 1934 mtrs sewer lines were actually laid. • The project has not been handed over to the municipality and is lying unutilized.
	It was observed that all the three projects were completed. However, these projects could not be handed over to the concerned municipalities due to legal issues.

Non functional STP at Halilshar

RFD at Kamarhati

4.2 NLCP

(i) Physical and financial progress

Name of the Lake	Sanctioned cost (₹ in crore)	Expenditure till date (₹ in crore)	Sanctioned date of completion	Date of completion
Mirik lake	4.01	0.60	February 2006	Ongoing
Ravindra Sarovar	6.96	3.86	March 2004	Ongoing

(ii) Performance of the Project

Project Name	Findings
Mirik Lake	• The restoration and consevation of Mirk Lake included components like bank protection, fencing work, construction of silt & debris arrestor, afforestation, de-siltation and public participation, waste treatment, underground drainage etc. • The project was to be completed by February 2006 but it was still ongoing. • NRCD released ₹ 1.00 crore as first installment but KMDA could spend only ₹ 60.26 lakh till March 2009. KMDA had entrusted the execution of waste treatment and allied works to Siliguri Jalpaiguri Development Authority (SJDA) which were nearing completion. Further, an amount of ₹ 50 lakhs had been released to Darjeeling Gorkha Hill Council (DGHC) in April 2005 for executing the remaining work like bank protection, de-siltation, jhora lining, fencing etc. However, DGHC had not submitted any report to KMDA regarding their progress of work. Thus, the project for restoration and conservation of Mirik Lake was yet to be completed even after a time overrun of more than five years.
Ravindra Sarovar	• The restoration and consevation of Ravindra Sarovar included components like bio-remediation, upkeep, lake bank protection and fencing and lake beautification. • The project was scheduled for completion by March 2004 but it continued without any extension as of March 2011. • The bio-remediation was originally proposed for improvement of water quality of Ravindra Sarovar as huge number of slum squatters were using the lake water for bathing and washing of clothes. However, bio-remediation work was not initiated. • Further, the, water quality reports of Sea Explorers' Institute, Jadavpur University 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. Thus, the project for restoration and conservation of Ravindra Sarovar was yet to be completed even after a time overrun of more than seven years.

Littered shoreline of Rabindra Sarovar

Weeds choking Rabindra Sarovar

5. Monitoring of programmes for control of water pollution

5.1 NRCP

By Chief Executive of implementing agency	By Divisional Project Monitoring Cell	Steering Committee chaired by Chief Secretary of State	High powered committee under CM
8 out of 10 projects	0 out of 10 projects	0 out of 10 projects	0 out of 10 projects

Further, it was observed that regular monitoring of the water body and the environment done by West Bengal State Pollution Control Board (WBSPCB) for two locations- Ganga/Barrackore and Mahananda/Siliguri.

5.2 NLCP

By Inter-Departmental coordination committee	By Steering Committee at the district level	By Lake specific Monitoring Committee	Water quality monitoring plan
2 out of 2 projects	**0** out of **2** projects	**1** out of **2** projects	**0** out of **2** projects

5.3 Ground water (in six blocks test checked)

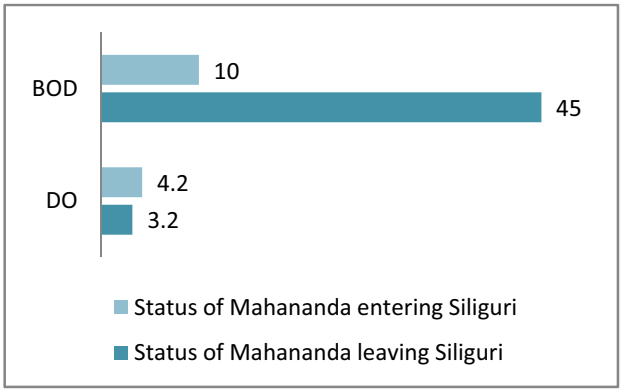
Whether system exists for monitoring of groundwater Pollution	Whether regular monitoring done	Whether water quality laboratories established	Whether Field Testing Kits issued to all the panchayats
Yes	No,in 5 out of 6 blocks	Yes, except in one block	No

6. Outcomes

6.1 NRCP

(a) Water quality of Mahananda after Siliguri

(a) Bio chemical Oxygen demand (BOD) and Dissolved Oxygen (DO) measured in Mahananda river at the time of its entering the town and leaving the town is shown in the graph alongside. It can be seen that BOD levels increase drastically after Mahananda river leaves Siliguri, pointing to inadequacy of pollution control measures. Further DO level in the river also falls.



(b) Quality of water in Hoogly after Gayespur/Halilshar

No Information was available regarding the quality of River Hoogly before it enters Gayespur/Halilshar and after it leaves Gayespur/Halilshar.

(c) Quality of water in Ganga after Barrakpore

Status of Ganga on entering Barrakpore in terms of DO, BOD and TC is 5.6 mg/lts, 3.2 mg/lts and 210000/ 100ml respectively. However, the quality of Ganga after it leaves Barrakpore was not measured. Hence, it could not be ascertained if the quality of water in Ganga had been improved after its inclusion in NRCP.

6.2 NLCP

As the projects on improving water quality of Mirik lake, Darjeeling and Ravindra sarovar lake, Kolkata were still in progress, no conclusions could be drawn about impact of NLCP in restoring the lake.