8

WATER POLLUTION IN INDIA

MINISTRY OF ENVIRONMENT AND FOREST

PUBLIC ACCOUNTS COMMITTEE
(2014-15)

EIGHTH REPORT

SIXTEENTH LOK SABHA

LOK SABHA SECRETARIAT
NEW DELHI

P.A.C. NO. 2039

EIGHTH REPORT

PUBLIC ACCOUNTS COMMITTEE
(2014-15)

(SIXTEENTH LOK SABHA)

WATER POLLUTION IN INDIA

MINISTRY OF ENVIRONMENT AND FOREST

Presented to Lok Sabha on: 11/12/2014

Laid in Rajya Sabha on: 11/12/2014

LOK SABHA SECRETARIAT
NEW DELHI

December, 2014 / Agrahayana, 1936 (Saka)

CONTENTS

*not appended with the cyclostyled Report.

COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2014-15)

Prof. K.V. Thomas - Chairperson

MEMBERS

LOK SABHA

2. Shri S.S. Ahluwalia
3. Shri Sudip Bandyopadhyay
4. Shri Ranjit Singh Brahmpura
5. Shri Nishikant Dubey
6. Shri Gajanan Kirtikar
7. Shri Bhartruhari Mahtab
8. Shri Ramesh Pokhriyal "Nishank"
9. Shri Neiphiu Rio
10*. Shri Dushyant Singh
11. Shri Janardan Singh Sigriwal
12†. Shri Shiv Kumar Udasi
13. Dr. Kirit Somaiya
14. Shri Anurag Thakur
15‡. Dr. P. Venugopal

RAJYA SABHA

16. Shri Satyavrat Chaturvedi
17. Shri Vijay Goel
18. Dr. Satyanarayan Jatiya
19. Shri Bhubaneswar Kalita
20. Shri Shantaram Naik
21. Shri Sukhendu Sekhar Roy
22. Shri Ramchandra Prasad Singh

SECRETARIAT

1. Shri A.K. Singh - Joint Secretary
2. Smt. Anita B. Panda - Director

---

* Elected w.e.f. 3rd December, 2014 *vice* Shri Rajiv Pratap Rudy who has been appointed as Minister w.e.f. 9th November, 2014.
† Elected w.e.f. 3rd December, 2014 *vice* Shri Jayant Sinha who has been appointed as Minister w.e.f. 9th November, 2014.
‡ Elected w.e.f. 3rd December, 2014 *vice* Dr. M. Thambidurai who has been chosen as Hon'ble Deputy Speaker, Lok Sabha and has since resigned from the membership of the Committee.

COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2013-14)

Dr. Murli Manohar Joshi - Chairman

MEMBERS
LOK SABHA

2. Shri Anandrao Adsul
3. Dr. Baliram
4. Shri Ramen Deka
5. Shri Sandeep Dikshit
6. Dr. M. Thambi Durai
7. Shri T.K.S. Elangovan
8. Shri Jayaprakash Hegde
9. Dr. Sanjay Jaiswal
10. Shri Bhartruhari Mahtab
11. Shri Abhijit Mukherjee
12. Shri Sanjay Brijkishorlal Nirupam
13. Shri Ashok Tanwar
14.* Shri Ajay Maken
15. Shri Dharmendra Yadav

RAJYA SABHA

16. Shri Prasanta Chatterjee
17. Shri Prakash Javadekar
18.† Shri Ashwani Kumar
19. Shri Satish Chandra Misra
20.‡ Dr. V. Maitreyan
21. Shri N.K. Singh
22. Smt. Ambika Soni

---

* Elected w.e.f. 14th August, 2013 *vice Dr. Girija Vyas* appointed as Minister of Housing, Urban Development & Poverty Alleviation w.e.f. 17th June, 2013.

† Elected w.e.f. 3rd September, 2013 *vice* Dr. V. Maitreyan ceased to be a Member upon his retirement as a Member of Rajya Sabha w.e.f. 24th July, 2013.

‡ Elected w.e.f. 3rd September, 2013 *vice Dr. E.M. Sudarsana Natchiappan* appointed as Minister of State for Commerce and Industry w.e.f. 17th June, 2013.

(iv)

COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2012-13)

Dr. Murli Manohar Joshi - Chairman

LOK SABHA

2. Shri Anandrao Vithoba Adsul
3. Dr. Baliram
4. Shri Sandeep Dikshit
5. Dr. M. Thambidurai
6. Shri T.K.S. Elangovan
7. Shri Anant Kumar Hegde
8. Shri Bhartruhari Mahtab
9. Shri Sanjay Nirupam
10. Shri Shripad Yesso Naik
*11. Shri Abhijit Mukherjee
12. Shri Ashok Tanwar
†13. Shri Takam Sanjoy
14. Dr. Girija Vyas
15. Shri Dharmendra Yadav

RAJYA SABHA

16. Shri Prasanta Chatterjee
17. Shri Prakash Javadekar
18. Shri Satish Chandra Misra
19. Shri Sukhendu Sekhar Roy
20. Shri J.D. Seelam
21. Shri N.K. Singh
22. Prof. Saif-ud-Din Soz

---

* Elected w.e.f 6th December, 2012 *vice* Shri Sarvey Sathyanarayana appointed as Minister on 28th October, 2012.
† Elected w.e.f 6th December, 2012 *vice* Dr. Shashi Tharoor appointed as Minister on 28th October, 2012.

(V)

COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE
(2011-12)

Dr. Murli Manohar Joshi - Chairman

LOK SABHA

2. Shri Anandrao Vithoba Adsul
3. Dr. Baliram
4. Shri Sandeep Dikshit
5. Shri Anant Kumar Hegde
6. Shri Bhartruhari Mahtab
7. Shri Shripad Yesso Naik
8. Shri Sanjay Nirupam
9. Shri Jagdambika Pal
10. Dr. Kavuru Sambasiva Rao
11. Shri Adhi Sankar
12. Kunwar Rewati Raman Singh
13. Shri K. Sudhakaran
14. Dr. M. Thambidurai
15. Dr. Girija Vyas

RAJYA SABHA

16. Shri Tariq Anwar
17. Shri Prasanta Chatterjee
18. Shri Naresh Gujral
19. Shri Prakash Javadekar
20. Shri Satish Chandra Misra
21. *Shri J.D. Seelam
22. Prof. Saif-ud-Din Soz

---

* Elected w.e.f. 29th August 2011 *vide* the vacancy occurred *vice* Smt. Jayanti Natarajan appointed Minister w.e.f. 12th July, 2011

INTRODUCTION

I, the Chairman, Public Accounts Committee (2014-15) having been authorised by the Committee, do present this Eighth Report (Sixteenth Lok Sabha) on **'Water Pollution in India'** based on C&AG Report No. 21 of 2011-12, Union Government for the year ended March 2012 related to the Ministry of Environment and Forest.

2. The above-mentioned Report of the Comptroller and Auditor General of India was laid on the Table of the House on 16th December, 2011.

3. The Public Accounts Committee (2011-12) took up the subject for detailed examination and report. The Committee took evidence of the representatives of the Ministry of Environment and Forest on the subject at their sitting held on 17th July, 2012. As the examination of the subject could not be completed due to paucity of time, the Public Accounts Committee (2012-13) and 2013-14 re-selected the subject to continue the examination. However, due to dissolution of the Fifteenth Lok Sabha, the draft Report could not be considered for adoption by the Public Accounts Committee (2013-14). Accordingly a Draft Report was prepared and placed before the Committee (2014-15) for their consideration. The Committee considered and adopted this Draft Report at their sitting held on 25th November, 2014. The Minutes of the Sittings are appended to the Report.

4. For facility of reference and convenience, the Observations and Recommendations of the Committee have been printed in thick type and form Part- II of the Report.

5. The Committee thank their predecessor Committee for taking oral evidence and obtaining information on the subject.

6. The Committee would like to express their thanks to the representatives of the Ministry of Environment and Forest for tendering evidence before them and furnishing the requisite information to the Committee and to the general public for submitting memorandum/suggestions in connection with the examination of the subject.

7. The Committee place on record their appreciation of the assistance rendered to them in the matter by the Office of the Comptroller and Auditor General of India.

NEW DELHI;
December, 2014
Agrahayana 1936 (Saka)

PROF. K.V. THOMAS
Chairperson,
Public Accounts Committee.

(vii)

R E P O R T

CHAPTER – I

INTRODUCTORY

I. INTRODUCTION

1.1. Water is the basis of all life. It is fundamental for human existence, ecological balance and for the very future of our planet. The National Water Policy declares water a scarce national resource fundamental to life, livelihood, food security and sustainable development. Safe drinking water is a basic need and a right for every human being. Clean, safe and adequate fresh water is vital to the survival of all organisms and the smooth functioning of key systems, entities and economies. Water based eco-systems provide a diversity of services vital for human well-being and poverty alleviation and the delivery of fresh water is a particularly important service both directly and indirectly. While water pollution and contamination weakens or destroys natural eco-system that supports human health, food production and bio-diversity, polluted water can lead to serious problems with diseases and death of humans, animals, plant and vegetation.

1.2. India is a signatory to the Rio+20 United Nations Conference on Sustainable Development relating to water and sanitation held in Rio de Janeiro, Brazil from 20-22 June, 2012. The Rio Conference gave recognition that water is at the core of sustainable development and therefore, reiterated the importance of integrating water in sustainable development. The Conference committed to the progressive realisation of access to safe and affordable drinking water and basic sanitation for all as necessary for poverty eradication, the improvement of women and to protect human health and to significantly improve the implementation of integrated water resource management at all levels as appropriate. Commitments regarding the human right to safe drinking water and sanitation, to be progressively realised for our population with full respect for national sovereignty was reaffirmed while highlighting the commitment to the 2005-2015 International Decade for Action, "Water for Life." The Supreme Court of India in its Judgment dated 28.8.1996 in the case of Vellore Citizens Welfare Forum vs. Union of India and Others also took cognisance of 'Sustainable Development' as the answer to meet the needs of the present without compromising the ability of future generations to meet their own needs and upheld 'The Precautionary Principle' and 'The Polluter Pays' principle as essential features of Sustainable Development and interpreted that these

principles are part of the environmental law of the Country. India's participation in earlier UN Conferences on Human Environment held at Stockholm in June 1972 and that on Environment and Development Rio De Janeiro in June 1992 resulted in the enactment of the National Green Tribunal Act, 2010 providing for establishment of a National Green Tribunal for effective and expeditious disposal of cases relating to environmental protection. Section 20 of the Act *ibid* clearly stipulates that the principles of sustainable development, the precautionary principle and the polluter pays principle are to be applied while passing any order or decision or award.

1.3. Various aspects of the issue of water pollution, albeit, limited to the pollution in River Ganga had engaged the attention of the earlier PACs (2000-2001, 2001-2002, 2002-03 and 2003-04) wherein oral evidences of not only the representatives of the Ministry of Environment and Forests (MoEF) but also from the State Governments of Uttranchal, Haryana, Uttar Pradesh and West Bengal were taken in connection with the examination of subject 'Ganga Action Plan' (GAP) and the 62nd Report of PAC (2003-2004), 13th Lok Sabha contained a number of findings including State specific ones regarding the slow pace of developing infrastructure to control pollution in Ganga River. The Committee had then deplored the inefficiency and lack of foresight on the part of the implementing agencies of GAP I and II and had observed then that unless urgent measures were instituted to accelerate the pace of work on control of pollution, the situation would deteriorate further causing irreparable loss to the entire Ganga river system. Stressing the need to generate additional resources by way of introducing user charges; 'beneficiaries pay' and 'polluters pay' principle along with other collective fine system, etc., the Committee had also emphasised on the core issue of the need for efficient and co-ordinated working of different departments/agencies working for the control of pollution. The Committee also found that the implementation of GAP, had been more of piecemeal solution for tackling a complex problem and failed to treat the river eco-system entirely.

1.4. The Committee had then, further observed that for such a mass oriented programme as GAP, a crucial aspect like public participation which could have been a deciding factor in the successful implementation of the GAP had not been given adequate attention. The Committee recommended energetic mass awareness efforts to establish a pattern of co-operative relationship between the Government NGOs, V.Os

and Associations and also appropriate measures for initiating a public awareness campaign with the help of law enforcing agencies and community leaders to inculcate a scientific temper in the people so that people do not become a compulsive partner in polluting a river they revere as 'holy'. The Committee was, however, not satisfied with the Action Taken thereon by the MoEF as contained in the 26th Report of PAC (2005-06), (ATR on 62nd Report on GAP). They had deplored the casual attitude of the Ministry towards such a vexed issue as community participation and involvement of the Public. The Committee had also observed that no amount of additional resource will rejuvenate the GAP until the system stops tolerating the officials who do not perform. Amelioration in governance through improved performance and accountability through public participation was the basic thrust of the Committee's recommendations.

II. AUDIT REVIEW

1.5. The present enquiry of the Committee is based on the C&AG's Report No. 21 of 2011-12 (Union Government – Scientific Departments) on the 'Performance Audit of Water Pollution India' which was laid in Parliament on 16th December, 2011. The Comptroller and Auditor General of India conducted a comprehensive Performance Audit of Water Pollution in India during 2010-11 after their Stakeholders' Conference on Environment Audit held in July, 2009 flagged water pollution as the most important environmental issue and perhaps remains to be India's largest environmental problem. The audit sought to examine the broad contours of policy, programmes, institutions and initiatives taken by Ministry of Environment & Forests (MoEF) to address the issue and also to examine availability of data regarding water pollution, assessment of risks to health and environment; and sustainability of the measures undertaken to address water pollution. The audit examination extending to 140 projects across 24 polluted stretches of rivers, 22 lakes and 116 blocks across 25 States of India revealed among others that water pollution has not been adequately addressed in the existing Legislative and Policy frame work. Audit also pointed out that water pollution in the 14 major, 55 minor and several hundred small rivers of the Country remains a serious concern for want of effective legislative and policy framework. While India has the Water (Prevention and Control of Pollution) Act, 1974 in place, the law does not address the issue of restoration of the polluted water bodies. It also does not define stricter financial and non-financial penalties to environmental offenders. As per the extant penalty provisions, the maximum fine is limited to ₹ 10,000 for cases relating to water pollution and ₹ 1,00,000 for

environmental pollution. This lacuna coupled with a highly tolerant inspection regime of the SPCBs (State Pollution Control Boards) ensures that the costs of defiance, non-adherence and violations are lower than the costs of compliance. Overall planning and monitoring of programmes to control pollution of rivers and lakes in India have not had the desired results pointing to weak internal controls existing at all levels of Government. For instance, 82% of the projects undertaken under National River Conservation Programme (NRCP) were completed after the scheduled date of completion and 28 projects costing ₹ 251.27 crore were constructed but not utilized as yet. The data on the results of river cleaning programmes being implemented since 1985 are also not very encouraging with most of the rivers continued to be plagued by high levels of organic pollution and low level of oxygen availability for aquatic organisms; and most lakes in India found to be under threat from nutrient overloading and eventual choking up from the weeds proliferating the nutrient rich water. Audit findings also pointed to inadequate funds as well as inefficient and uneconomic utilization of available funds.

1.6. At the Centre, the Audit methodology was guided by the Stakeholders Conference on Environment Audit held in July, 2009 and the International Conference on Environment Audit on Concerns about Water Pollution held in March, 2010 and suggestions received from the general public regarding water pollution problems faced by them. An entry Conference with MoEF was held on 30 July, 2010 wherein the audit objectives, scope of audit, audit criteria and audit methodology were discussed. Exit conference on 6 June, 2011 was held with MoEF where audit findings were discussed.

1.7. The main audit objectives were to ascertain whether :

- Inventory of water sources has been prepared and whether the overall status of quality of water in rivers, lakes and groundwater has been adequately assessed in India;
- Risks of polluted water to health of living organisms and the impact on environment have been adequately assessed;
- Adequate policies, legislations and programmes have been formulated and effective institutions been put into place for pollution prevention, treatment and restoration of polluted water in rivers, lakes and ground water;

- Programmes for pollution prevention, treatment and restoration of polluted water in rivers, lakes and ground water have been planned, implemented and monitored efficiently and effectively;
- Funds were utilised in an efficient and economic manner to further the aim of reduction of water pollution;
- Adequate mechanisms have been put in place by the government to sustain measures to tackle water pollution; and
- Programmes for the control of pollution had succeeded in reducing pollution levels in ground water and surface water and restoring water quality.

1.8. Audit criteria of the evaluation of performance were derived from the Water (Prevention and Control of Pollution) Act**,** 1974; Agenda 21 Document of the World Commission on Sustainable Development of the United Nations Conference on Environment and Development, held in Rio in June 1992; Guidelines for implementation and monitoring of National River Conservation Plan and National Lake Conservation Plan; National Water Policy, 2002; National Environment Policy, 2006; Implementation Guidelines for Integrated Water Resources Management; and specifically Integrated River Basin Management and Integrated Lake Basin Management; and Guidelines of United Nations Environment Programme (UNEP).

1.9. The main findings of the Audit Report are as under :

(i) Legislative and Policy framework

- Water pollution has not been adequately addressed in any policy in India, both at the Central and the State level.
- Absence of a specific water pollution policy incorporating prevention of pollution, treatment of polluted water and ecological restoration of polluted water bodies revealed inadequate government efforts in these areas.

(ii) Planning for control of pollution of rivers, lakes and ground water

Audit pointed out that overall planning for the control of pollution on part of MoEF and the States falls short of an ideal situation having repercussions on implementation of programmes for control of pollution and their outcomes. Such shortcomings include :

- Incomplete inventorisation of rivers/lakes and keystone species associated with them.

- Non-identification of existing pollution levels in rivers and lakes in terms of biological indicators.

- Non-identification and quantification of contaminants in rivers, lakes and ground water.

- Non-identification and quantification of human activities that impact water quality.

- Non-assessment of the risks of polluted water to health and environment.

- Non-adoption of the basin level approach for control of pollution.

- Non-development of water quality goals and corresponding parameters for each river/lake with resultant failure to enforce these.

(iii) Implementation of programmes for control of pollution of rivers, lakes and ground water

Programmes to control pollution of rivers and lakes in India have not had the desired results.

- Current programmes for control of pollution of rivers, lakes and ground water were insufficient.

- Institutional set-up to manage programmes for control of pollution in rivers, lakes and ground water was inadequate.

- Inclusion of rivers and lakes into National River Conservation Plan and National Lake Conservation Plan, respectively, was flawed.

- Unsatisfactory performance of projects undertaken under NRCP with only 82 per cent of the projects completed after the scheduled date of completion and 28

projects costing ₹ 251.27 crore constructed but not utilised. States implementing the projects faced problems in land acquisition, getting requisite permissions, especially forest clearances, technical problems, problems from contractors, etc.

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

(iv) Monitoring of programmes for control of pollution of rivers, lakes and ground water

Monitoring of programmes was inadequate which points to weak internal controls existing at all levels of government.

- Inadequate inspection and monitoring of projects being implemented under NRCP and NLCP at all three levels, i.e., local level, State level and Central level.

- Paucity of network for tracking pollution of rivers, lakes and ground water due to inadequate number of monitoring stations, lack of real- time monitoring of water quality and inadequate disseminaton of the data on water quality.

III. EXAMINATION BY PAC

1.10. Against the above backdrop, the PAC (2011-12) selected the subject for detailed examination and report. However, as the subject could not be taken up for examination during the tenure of the Committee, it was carried forward and taken up by the PAC (2012-13) as the unfinished work of its predecessor. The Committee obtained background material and detailed written reply from the MoEF (Ministry of Environment and Forests) and also took oral evidence of the representatives of the Ministry on 17.07.2012 and sought Post Evidence Replies from them on various aspects of the subject pertaining to multifarious Ministries/Departments/Agencies involved.

1.11. Keeping in view the topicality of the subject, and also in view of the magnitude and enormity of the issue, the Committee called for suggestions from the public by way of Memoranda on the subject of 'Prevention of Water Pollution in India'. A PAC communiqué was published on 31.8.2012 in 30 leading dailies all over the Country in English, Hindi and other vernacular languages calling for suggestions on 'Prevention of Water Pollution' and a total of 118 Memoranda (64 english and 54 in Hindi) were received from the public. Suggestions highlighted in these public views includes *inter-alia* taking help of Regional Research Laboratories (RRL) for finding out the exact nature of pollution; Adequate funds arrangements for setting up treatment plant through Public Private Partnerships (PPP); Strict mandatory benchmarks for Sewage disposal and enforcement of monitoring thereof; Higher penalties for polluters; Community Participation; Awareness campaigns involving media, schools, farmers, villagers with special emphasis on ladies; Citizens Duty Charter/Conduct Rules for conservation of environment; Self Help Groups; Prevention by addressing the 3 Ps – Pollutants, Processes and People; Citizens' Police and Social Audit; Bringing Water to the Concurrent List; Encouraging more use of organic farming; Regular water purity testing; Control of Population growth for control of water pollution; Augmentation of Capacity of Sewage Treatment Plants; Strengthening of existing Monitoring System; Stringent Polluter Pays Approach; Independent Environment Impact Assessment; Informal Regulation and People's Participation; Strict enforcement of water Pollution Control Laws; Use of GIS and Remote Sensing based Decision Support Systems; Exploring different models of partnership for managing pollution; Regular training and continuous capacity building of all stakeholders involved; Involvement of Panchayats; Lifestyle change for less water pollution; Provision for Bio Toilets in trains; etc.

The suggestions/views received from the Public have been summarised and brought out in **Annexure - II** of this Report.

1.12. Recognising the overriding need for heightening public awareness and community involvement towards finding a sustainable solution to the nation's most important environmental issue, the Committee also obtained a detailed note on the measures instituted by the Ministry of Human Resource Development (Department of School Education and Literacy) to sensitise the impressionable minds of students on environmental issues including the need for prevention of water pollution. The

Department, thereupon, furnished a detailed note bringing out the measures incorporated by the NCERT and the CBSE in their various curriculum for requisite sensitization of students. These include *inter-alia* incorporation of various topics especially related to Water Pollution and its prevention in the textbooks and other curricular material developed by the National Council of Educational Research & Training (NCERT) for the Upper Primary, Secondary and the Higher Secondary Stages to sensitize impressionable minds of students; encouraging setting up of Eco Clubs in Schools *vide* CBSE Circular No. 16 dated 12.06.2001**;** directions to all affiliated schools of CBSE to impart Environment Education integrated in different subjects in all classes from I-X through the activity mode to sensitize students to global warming and other environment related concerns; directives sent to Schools from time to time to impart education to students about environmental protection issues; CBSE Teachers' Manual on Environmental Education from Classes I to VIII on Climate Change and Global Warming covering topics on Water Cycle in Nature, Purifying Water by Solar Energy, How Plants Modify the Environment and Green House Effect; CBSE Training Manual For Class IX covering topic on Water Conservation; Section on Eco Clubs in the quarterly journal CENBOSEC published by the Board sensitizing Schools about Water Management; Organization of National Urban Water Awards (NUWA) in the year 2010; Science Exhibitions and other Water Conservation activities.

The aforesaid detailed note received from the Ministry of Human Resources Development (Department of School Education & Literacy) along with its enclosures is reproduced in **Annexure - III** of this Report.

1.13. As the examination of the subject could not be concluded during the tenure of PAC (2012-13), it was carried forward and taken up by the PAC (2013-14) as the unfinished work of its predecessor. The examination of the written and oral information/testimony by the Committee is contained in the succeeding paragraphs.

CHAPTER – II

CONSTITUTIONAL FRAMEWORK

2.1. India is the first Country, which has made provisions for the protection and improvement of environment in its Constitution. In the 42nd amendment to the Constitution in 1976, provisions to this effect were incorporated in the Constitution of India with effect from 3rd January, 1977. The Directive Principles of State Policy contained in Article 48-A enjoins upon the State to make endeavour for protection and improvement of the environment and for safeguarding the forest and wild life of the country. Article 51-A(g) of the Constitution provides that it shall be the duty of every citizen of India 'to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures'.

2.2. The subject "Water" is placed in the Constitution in Entry 17 of List II (State List) of Schedule VII. However, the caveat is Entry 56 of List I (Union List), which says, "Regulations and development of interstate rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by Law to be expedient in the public interest." However, the Centre has made little use of this power.

2.3. The 73rd amendment added the Eleventh Schedule (Article 243G) to the Constitution of India which provides that subject to the provisions of this Constitution, the Legislature of a State may, by law, endow the Panchayats with such powers and authority as may be necessary to enable them to function as institutions of self-government and such law may contain provisions for the devolution of powers and responsibilities upon Panchayats at the appropriate level, subject to such conditions as may be specified therein, with respect to -

(a) the preparation of plans for economic development and social justice;

(b) the implementation of schemes for economic development and social justice as may be entrusted to them including those in relation to the matters listed in the Eleventh Schedule.

2.4. Further, the 11th Schedule to the Constitution lists Minor Irrigation, Water Management, Watershed Development and Drinking water as subjects relating to water that have been entrusted to the Panchayats.

2.5. Similarly, the 74th amendment to the Constitution added the twelfth schedule (Article 243W) to the Constitution which provides that subject to the provisions of this Constitution, the Legislature of a State may, by law, endow –

(a) The Municipalities with such powers and authority as may be necessary to enable them to function as institutions of self-government and such law may contain provisions for the devolution of powers and responsibilities upon Municipalities, subject to such conditions as may specified therein, with respect to –

(i) the preparation of plans for economic development and social justice;

(ii) the performance of functions and the implementation of schemes as may be entrusted to them including those in relation to the matters listed in the Twelfth Schedule;

(b) The Committees with such powers and authority as may be necessary to enable them to carry out the responsibilities conferred upon them including those in relation to the matters listed in the Twelfth Schedule.

2.6. The Twelfth Schedule lists water supply for domestic, industrial and commercial purposes, public health, sanitation, conservancy and solid waste management, urban forestry, protection of the environment and promotion of ecological aspects; slum improvement and upgradation as subjects pertaining to environment having relevance to water pollution that have been entrusted to the Municipalities.

2.7. With respect to constitutional provisions, the Secretary, MoEF submitted during the oral evidence as under :

> "Now, if you kindly look at 73rd and the 74th Amendments of the Constitution, it has very clearly transferred the subject of sanitation to the local authorities. This has created confusion at the ground level where the Pollution Control Boards say very clearly that water act and air act are all to do with industry and it has not said anything about what action we can take against local authorities.... there is no mention of penalties, restoration cost, etc. So, they use only 33A which is the concerned section of Water Act by which they close the industry. If the industry comes to some level, they take some samples and then they open the industry. This is all that they do. Now, local authorities say they have no expertise, wherewithal, resources to carry on treating and connecting door-to-door. They are

not being able to get any sewerage charges. Of course, some cities have started but much more has to be done. So, this dichotomy is going on at the field level and there is lot of passing of buck. In this situation, it is absolutely essential that there is completely close coordination at the Centre for which I requested the Planning Committee to start the ball rolling based on this Road Map."

2.8. On being asked to detail the exact lacunae in the various Acts pertaining to the issue of water, the MoEF in their written reply submitted that 'although water is a State subject, guidelines for the preparation of Water Quality Management Plan have been circulated to all the States. However, none of the States have prepared Water Quality Management Plan till date, as it was not mandatory for State to follow the central directive on the subject.'

2.9. Responding to a pointed query, the MoEF categorically stated that Water may be made a central subject in the Constitution for control and regulation and to solve a variety of problems which relates to interdependent activities emanating at the State level.

2.10. The Prime Minister himself in his inaugural speech during the 'India Water Week' in April, 2012 observed that a problem that hindered better Water Resource Management was the fragmented and inadequate institutional and legal structure for water and that there was an urgent need for reforms. By virtue of Article 246 read with Entry 17, List II, States have exclusive jurisdiction over water that are located within their territories. It is arguably this status of water in the Constitution that constrains the highest in the executive and the judiciary despite their pronouncements and commitment to resolve problems related to water. In the light of the above, the MoEF was asked to furnish their views as to the inadequacy of the present institutional and legal structure and whether a Constitutional amendment would indeed pave the way for better coordination of not only overall Water Resources Management of the Country but also for implementation of water pollution control programmes. In reply thereto, the Ministry stated that the present arrangement with respect to institutional and legal arrangement for water pollution control in the Country has been working satisfactorily. However, constitutional amendments may be made to bring Water under the Concurrent List of the Constitution to improve water sector in a holistic manner, as at present it is a State subject except for inter State rivers.

2.11. On a specific query of the Committee as to whether a Constitutional amendment will be needed, the Secretary, MoEF submitted during oral evidence that :

> "It is really a huge task. But, I think the time has come for us to take it extremely seriously because we will not have water in many parts of the Country"

2.12. The Tenth Report (15th Lok Sabha) of the Departmentally Related Parliamentary Standing Committee on Water Resources, Lok Sabha on 'Augmentation of Depleted Ground Water Level, Sustainable Development, Conservation, Management, Use of Ground Water and Prevention of Water Pollution presented to the Parliament on 30.8.2011 *vide* para 22 of their recommendations stressed on the need to build a national consensus to bring water either in the Union List or in the Concurrent List. The Committee had urged the Government to initiate steps in right earnest to strive to build national consensus on this aspect after due consultation with the State Governments so that a comprehensive national plan of action is evolved for water conservation, development, exploitation and equitable distribution in the larger and long term national interest. The Committee's 12th Report (15th Lok Sabha) presented to Parliament on 27.3.2012 on the Action Taken by the Government on this particular recommendation reproduced the Action Taken Note furnished by the Ministry of Water Resources which stated that the Cabinet Secretariat constituted a Committee on Allocation of National Resources (CANR) under the Chairmanship of Shri Ashok Chawla which submitted its report on 31st May, 2011 which *inter-alia* recommended as follows :

> "The Committee sees an urgent need to have a comprehensive national legislation on water. This can be done either through bringing water under the Concurrent List and then framing the appropriate legislation; or by obtaining consensus from a majority of the States that such a 'framework law' is necessary and desirable as a Union enactment. The legal options in this regard need to be examined by the Ministry of Water Resources. The national legislation should clarify a common position on a number of issues, e.g., need to consider all water resources as conjunctive, unified whole; water as a common property resource; principles of allocations and pricing and so on. The framework legislation should recognize that pollution also leads to conjunctive use of water, which makes the resources unusable for other purposes." The recommendations of CANR have been referred to a Group of Ministers. It is further stated that Ministry of Water Resources has established National Water Mission Secretariat to achieve goals & Strategies identified under National Water Mission. Two of the five goals of the National Water Mission were: promotion of citizen and State actions for water conservation, augmentation and preservation; and focused attention to vulnerable areas including over exploited area."

2.13. The National Water Policy, 2012 adopted by the National Water Resources Council on 28 December, 2012 states that :

"Even while it is recognised that States have the right to frame suitable policies, laws and regulations on water there is a felt need to evolve a broad over-arching national legal framework of general principles on water to lead the way for essential legislation on water governance in every State of the Union and devolution of necessary authority to the lower tiers of government to deal with the local water situation."

CHAPTER – III

LEGISLATIVE FRAMEWORK

I. LACUNAE IN THE LEGAL FRAMEWORK

3.1. The goal of compliance to environmental laws was to assure the average citizen that natural values were protected, that specific violators were identified and that they complied with legal provisions in order to safeguard human health and environment and to deter future violations. Audit pointed out that the legal and institutional frameworks for water quality protection must evolve from the present fractured and often unenforceable guidelines to a comprehensive approach to pollution prevention and source water protection.

3.2. Audit pointed out that at the Centre, Water (Prevention and Control of Pollution) Act was enacted in 1974 under Article 252 of the Constitution which provides power to the Parliament to legislate for two or more States by consent and adoption of such legislation by any other State. The Act provides for prevention and control of water pollution and for maintaining or restoring of wholesomeness of water in the Country. To achieve this objective, the Act provided for establishing Boards at the Central and State level for the prevention and control of water pollution and conferred and assigned powers and functions relating this to these Boards. It lays down a system of consent whereby no industry or operator process or any treatment and disposal system can be established without the previous consent of the State Board. Similarly, no industry or process can discharge sewage or trade effluent into a stream or well or sewer or land in excess of the standards. Contravention of the provisions of this Act was punishable in monetary as well as non-monetary terms. As per the provisions of sections 25/26 of the Water Act, 1974, no industry or operator process or any treatment and disposal system can be established without the previous consent of the State Board and no industry or process can discharge sewage or trade effluent into a stream or well or sewer or land in excess of the standards and without the consent of the Board. Whosoever contravenes the provisions of sections 25 or 26 of the Water Act shall be punishable with imprisonment for a term which shall not be less than one and half years but which may extend to six years with fine under sections 43/44 of the Water Act. Accordingly, action was initiated from time to time

against the defaulter municipalities/industries by the concerned SPCB. The Board can also issue directions for closure and disconnection of electricity/water/any other service in case of persistent defiance by any polluting industry, operation and process under section 33-A of the Water Act and section 5 of the EPA Acts.

3.3. The Water (Prevention and Control of Pollution) Cess Act, 1977 provides for the levy of cess on use of water by various users of water i.e. industry and local authorities. This cess is meant to augment the funds required by the State Pollution Boards for their effective functioning in discharge of duties under the Water (Prevention and Control of Pollution) Act, 1974. The cess is collected by the State Government concerned and paid to the Central Government. The proceeds are credited to the Consolidated Fund of India. The Central Government, after due appropriation made by Parliament by Law, disburses such sums of money as it may think fit to the Central Board and the State Boards, having regard to the amount of cess collected by the State Government concerned.

3.4. Audit findings pointed out that the Water (Prevention and Control of Pollution) Act foresees a balance of strategies to ensure compliance: education and assistance; monitoring and inspections; communication and outreach. However, it falls short in the vital aspect of developing fair and differentiated responses to non-compliance and there was little evidence of the design of enforcement programmes to deter illegal conduct by creating negative consequences. Audit further pointed out that in the States, out of 25 States test checked, the Water Act, 1974 was adopted by all the 25 States and States Pollution Control Board/Committee were framed in all these States.

3.5. Audit findings also pointed out that the MoEF had not framed any legislation which specifically identifies pollution as an environmental offence and restoration of water bodies as a priority action. On being queried by the Committee, Ministry submitted that there was no proposal under their consideration for framing additional legislation in this regard.

3.6. The Road Map for Management of 'Water Pollution in India' brought out by the MoEF, for the implementation of recommendations/observations made in the Audit Report elaborately brings out the existing legislation for prevention and control of pollution from point and non-point sources, The Road Map also envisages an amendment to the

Environment (Protection) Act of 1986 proposing to address various important issues in environmental management *viz*. hike in penalties for contravention of its provisions; a civil administrative adjudication system to ensure fast-tracking of the imposition of penalties on environmental offenders; provision for furnishing suitable bank guarantees for specific performance and for restoration of the damaged environment; establishment of a National Environmental Appraisal and Monitoring Authority (NAEMA) to carry out environmental appraisals and monitoring of compliance conditions.

3.7. On being asked as to whether any attempt has been made to undertake a comprehensive review to examine the adequacy or relevancy of the extant provisions in the existing legal framework vis-a-vis the present enormous challenge being faced in the control of water pollution in India, the MoEF submitted that the matter of reviewing the provisions of various acts and rules pertaining to Water pollution has been carried out by Central Pollution Control Board (CPCB) in house in 2009 as well as in the regular conference with the Chairmen and Member Secretaries of the State Pollution Control Boards and Pollution Control Committees. The information was also collected from various State Pollution Control Boards and compiled. It was further submitted that suitable constitutional amendments are required to be made to bring Water under concurrent list of the Constitution to improve water sector in a holistic manner, as at present it is a State subject except for inter State rivers.

3.8. The MoEF was asked to highlight the level of compliance to the existing legal framework and also indicate the area which require more teeth in enforcement thereof. The Ministry submitted that the level of compliance with respect to the provisions of the Water (Prevention and Control of Pollution) Pollution Act, 1974 has been satisfactory so far. However, to make it more result oriented and in line with the aspirations of the people, State Governments may constitute Vigilance Committees consisting of enlightened Citizens, Farmers, Non-Governmental Organisations (NGOs), Academicians and Common man (users of water, living and surviving only on the river water resource) to monitor the use of river and water and to keep an eagle's eye on polluters as well as users of river water. The State Government may adopt more transparent ways to open up the mechanism of inspection, prosecution and closure of sources of pollution. The monitoring mechanism may be evolved to oversee implementation of rules and regulations pertaining to water pollution. Suitable mechanism may be worked out jointly

by State as well as Central Government to monitor interstate movement of water pollution with respect to bulk discharge of pollutants in to the river. It may also be useful to constitute flying squads to monitor hot spots, the polluted river stretches and lakes, etc, especially, upstream of drinking water intake points, to ensure that polluters do not spoil the water quality. Technological assistance may be required to set up floating watch towers in sensitive areas with respect to water quality, for better, continuous and reproducible results. The assistance of local fisherman and farmers may be taken for monitoring river water quality by using indigenous methods and techniques like using a floating aquarium to monitor river water quality. It was further submitted that the pollution control laws as they exist today follow the criminal justice system that was more time consuming being full of technicalities. There was therefore a need to bring in economic instruments as a means of pollution control. This, combined with command and control, results in more efficient implementation of laws and better control of pollution.

3.9. On being categorically asked to state whether there was any proposal to amend any of the provisions existing in the extant Acts/Rules, etc. and to indicate the status or the timeframe within which these amendments would be effected, the MoEF stated that at present there was no proposal pending with the Ministry for amendment of Acts/Rules etc.

3.10. On being asked to respond to the observation of audit that water pollution has not been adequately addressed in the legislative and policy framework, the MoEF stated as under :

> "The Water being State subject, major responsibility for providing sewerage facilities rests with the State Governments. The Ministry is only supplementing efforts of the State Governments for providing adequate sewerage facilities in the cities and towns which are discharging untreated or partially treated sewage into the rivers."

II. NEED FOR RESTRICTION FOR DRAINAGE OF SEWERS INTO RIVERS AND WATER BODIES

3.11. The Committee pointed out that in 1932, a British Commission ordered that a sewer drain in Varanasi be diverted into the Ganga River and ever since this provision took effect, sewers are being drained into rivers. On further being asked as to whether there had been any amendment to this provision of the 1932 Order, the MoEF submitted

that the Water (Prevention and Control of Pollution) Act 1974 takes care of this, under section 25 (c), which provides for, “to take permission to discharge sewage etc, in the river after treatment and to comply with prescribed discharge standards." On further being asked as to whether there was any other rule/regulation/order which restrict the drainage of sewers into rivers or other water bodies, the MoEF replied in the affirmative and stated that the same section 25(c) of the Water Act, 1974 takes care of the requirement.

3.12. The Committee sought a detailed note on the need for a Central Act which clearly stipulates the separation of rivers and sewers, considering the fact that sewage drainage was one of the most polluting source for rivers. The MoEF thereupon furnished the following note:

> "Water is considered as natural resource, available in plenty and distributed all over the Country but when subjected to variety of use it gets contaminated and renders it unfit for drinking, bathing, and industrial use due to presence of variety of pollutants which finally results in to shrinking availability of usable quality and quantity. Over the years this has become regular trend due to increased use of fresh water for industrial use, domestic use, for irrigation and power generation. The fresh water get contaminated and thus availability of fresh water become more scarce. During rainy season, the surface water storage gets cleaned of pollutants, ground water storage gets replenished but the trend has continued unabated. However, accumulation of heavy metals and pesticides in fish and soil may lead to health problems like *mini-mata* disease of Japan. The population growth and industrialization will further accentuate the problem of shortage of fresh water availability in the country. The National Water Policy has identified the main concerns which includes inter alia following:
>
> i. Large parts of India have already become water stressed. Rapid growth in demand for water due to population growth, urbanization and changing lifestyle pose serious challenges to water security;
> ii. There is wide temporal and spatial variation in availability of water, which may increase substantially with passage of time;
> iii. Growing pollution of water sources, especially through industrial effluents, is affecting the availability of safe water besides causing environmental and health hazards. In many parts of the country, large stretches of rivers are both heavily polluted and devoid of flows to support aquatic ecology, cultural needs and aesthetics;
> iv. Access to water for sanitation and hygiene is an even more serious problem. Inadequate sanitation and lack of sewage treatment are polluting the water sources; and
> v. The lack of adequate trained personnel for scientific planning, utilizing modern techniques and analytical capabilities incorporating information technology constrains good water management."

3.13. Considering above concerns raised in the National Water Policy 2012, the note further stressed that the severest impact on water resources which has put whole civilization into danger was contamination of fresh water due to uncontrolled discharge of treated, untreated and partially treated industrial effluents by industries and sewage discharged from cities and towns. According to a recent report of CPCB, against an estimated sewage generation of about 38254 mld from the Class-I cities and Class-II towns of the country, the available treatment capacity is for 11787 mld sewage. As per this report, nearly 39 % sewage treatment plants do not conform to the effluent discharge standards prescribed under the Environment (Protection) Rules for discharge into streams. The major reasons for non compliance of standards include poor operation and maintenance of plants due to inadequate resource mobilization by the State/ Urban Local Bodies, lack of technical man power and non availability of regular power supply. The agricultural runoff, excessive use of fertilizer and pesticides and non point sources of pollution has further compounded the problem of pollution of surface waters as they provide unlimited supply of nutrients for fueling the growth of water hyacinth and other weeds in the rivers, lakes and ponds.

3.14. On the aspect of a separate Central Act for separation of rivers and sewers, MoEF submitted that if existing institutions are strengthened for effective enforcement, a separate central act may not be required. However, strengthening SPCBs need to be looked into on aspects like Organisational Structure: SPCBs are isolated without any decision making role in development planning; lack of autonomy and accountability; Environment Management Procedures: Lack of integrated planning procedures, Lack of public/ Community participation Command and Control approach; Human Resources; Inadequate staff, lack of trained professionals, lack of training opportunities, lack of autonomy and accountability; Financial issues: Inadequate budgetary support, lack of economic incentives for compliance, economic instruments not used for environment planning; E-governance: Training, Hardware & Software, Rules and procedures.

III. INADEQUATE PENALTY PROVISIONS AND HIGHLY TOLERANT INSPECTION REGIME.

3.15. Audit scrutiny brought out the penalty provisions under various Acts relating to control and prevention of water pollution as indicated in table 3.15.

Table 3.15 : Penalty Provisions for Water Pollution

Name of the Act/ Provision	The Water (Prevention and Control of Pollution) Act, 1974	The Water (Prevention and Control of Pollution) Cess Act, 1977	The Environment (Protection) Act, 1986
Provision relating to penalty	Failure to comply with provisions or for contravention of the provisions of the act and the rules, orders and directions shall, in respect of each such failure or contravention, be punishable with	Failure to comply with provisions or for contravention of the provisions of the act and the rules, orders and directions shall, in respect of each such failure or contravention, be punishable with	Failure to comply with provisions or for contravention of the provisions of the act and the rules, orders and directions shall, in respect of each such failure or contravention, be punishable with
	• Imprisonment for a term which may extend to three months to six years • Fine which may extend to ₹ 10 thousand and In case of the failure continues, with an additional fine which may extend to ₹ five thousand for every day during which such failure continues after the conviction for the first such failure.	• Imprisonment which may extend to six months • Fine which may extend to ₹ one thousand • Or with both.	• Imprisonment for a term which may extend to five/seven years • Fine which may extend to ₹ one lakh, continued failure or contravention, with additional fine which may extend to ₹ five thousand for every day during which such failure or contravention continues after the conviction for the first such failure or contravention. • Or with both.

3.16. The maximum penalty prescribed under the Water (Prevention and Control of Pollution) Cess Act, 1977 is only ₹ one thousand, while the same under the Water (Prevention and Control of Pollution) Act, 1974 is ₹ 10 thousand. The maximum penalty under the Environment (Protection) Act, 1986 is ₹ one lakh. However, in the case of water pollution, the fine or penalty prescribed under the Water (Prevention and Control of Pollution) Act, 1974 would be applicable as per sub section 2 of section 24 of the Environment Protection Act, 1986. Thus, the maximum penalty/fine is limited to ₹ 10

thousand for water pollution. It was also observed in Audit that powers relating to filing of cases of violations were exercised by the SPCBs. While CPCB conducts random checks of Industries or other stake holders contributing to water pollution and cases of violations were reported to the respective SPCBs for their action and cases of serious violations were dealt with for notice of closure or closure under section 5 of the Environment Protection Act, 1986. Audit further pointed out that the CPCB/MOEF did not compile any information on cases of violations relating to water pollution filed by the SPCBs and amount of penalty/fine realized. The information relating to the cases, where the closure notices or final closure were ordered by CPCB was also awaited. In absence of information on the extent of violations of provisions of Acts relating to water pollution in various States, it was not clear how the effectiveness of implementation of these Acts were analyzed and monitored by the CPCB/MOEF. Thus, CPCB/MOEF was not aware of how the provisions, particularly provision of the levy of penalty under the Water (Prevention and Control of Pollution) Cess Act, 1977 and the Water (Prevention and Control of Pollution) Act, 1974 were being enforced, extent of violations compared to total users and extent of enforcement etc . Audit pointed out that the low quantum of penalty of ₹ 10 thousand as also the failure of the State in enforcing the provisions of the Act strictly to secure prevention and control of water pollution, has led to the situation where the cost of non compliance became significantly lower than the cost of compliance with the provisions of rules and orders under the Acts. Thus, there was need to strictly enforce the provisions of the Acts , while reviewing the quantum of penalty as also the wide disparity prevailing under the various Acts which ranged from ₹ 10 thousand to ₹ one lakh prescribed in Environment Protection Act, 1986.

3.17. While the responsibility of management and development of ground water rests with CGWB, the prevention of water pollution comes under the purview of MOEF and though the Act envisages both monetary and non-monetary penalties, ultimately, a highly tolerant inspection regime of the SPCBs ensures that the costs of defiance, non-adherence and violations were lower than the costs of compliance. MoEF stated in its reply that it had enacted legislations like Water (Prevention and Control of Pollution) Act and the Environment Protection, Act for control of water pollution in India. The Ministry further submitted that as per sections 25/26 of the Water Act, 1974, no industry or operator process or any treatment and disposal system can be established (which was likely to discharge sewage or effluents) without the previous consent of the State Board

and no industry or process can discharge sewage or trade effluent into a stream, well, sewer or land in excess of the standards and without the consent of the Board.

3.18. On a specific query as to whether the maximum fine of ₹ 10,000/- for cases relating to water pollution was felt to be adequate in the present set up, the Ministry agreed that the maximum fine of ₹ 10,000/- was not adequate and there was need to review the amount of fine imposed. It was evident that ever since 1974 when the Water Act was enacted, the quantum of penalty has remained static at ₹ 10,000. The Committee sought to know, whether in 38 years the Ministry had not felt the need for undertaking a review. The MoEF in their written reply stated that although judiciary has not followed the course of imposing fine for violation of pollution control laws and it too allowed the polluters to install requisite pollution control equipments in time bound manner. However, penalty may be enhanced from minimum ₹ 10,000 to ₹ 1,00,000 for violation of provisions of the Water Act, 1974 and the Environment (Protection) Act, 1986 without amending the provision for imprisonment. This additional penalty may be levied from the polluter at the time of filing of case in the court of law irrespective of outcome of the case.

3.19. On being asked about the time frame when India would be free from Water Pollution, the Secretary, MoEF deposed :

> "I think it is a great opportunity for our Ministry to be able to discuss perhaps India's largest environmental problem. I would also like to thank C&AG for taking so much trouble for going into depths of the issues both on the policy as also on the implementation front from quality and quantity aspects of water pollution which is extremely important. I am very grateful to them for having flagged it in the end of 2011 in this report on 'Water Pollution in India'. After the report came, we immediately read it and formed an expert Committee to look into the report and find out how to convert it into an implementation programme."

3.20. The Committee further sought to know how these recommendations have been taken care of and how the MoEF sought to remedy them. The Secretary, MoEF during evidence elaborately submitted as under:

> "It is a Road Map which means that it is an implementation plan of the C&AG observations. To the extent that it can be implemented within the existing legal framework and constitutional structure, this Road Map came to us in March, 2012. We have been discussing as to how we can move forward. I have had two meetings with Dr. Kasturi Rangan and others of the Planning Commission. We feel that since water pollution is an inter-State and inter-ministerial issue - it is inter-ministerial at the Centre and inter-State because of the fact that water is a State subject - this is absolutely essential that a lead coordinating agency actually pulls

all these forces together. This was also twice discussed with Dr. Kasturi Rangan over the last six months while this report was being prepared. What we have requested him and his officials in the Planning Commission is that they should make a body within the Planning Commission. It will review this matter with us and with the Ministry of Urban Development, Ministry of Agriculture, Ministry of Water Resources, Central Ground Water Boards and NGRBA plus the States concerned. As noted in the C&AG report, we have identified critical stretches of the river in States. There are 150 of them. We have identified the real major issues. We know that how to solve them; every technology is available and procedures are in place. Of course, resources are a problem but there is also the PPP model which has been developed to a great extent. It has also been recommended by the C&AG. So, we know that what to do but the problem is how we do it. We have addressed this issue of water pollution only from our side. You will be surprised to know that from 25 per cent to 30 per cent water pollution is industrial. If you talk to our Central Pollution Control Board or State Pollution Control Boards, then they will say that they will only look after the industrial pollution; they will close the industry for pollutes and they will open the industry if it comes to stop that process. That is all. They cannot move against the local authorities who are in-charge of the domestic pollution, commercial pollution and agricultural pollution which is non-point in nature. It covers 70 per cent of the pollution load on water in India."

3.21. He further supplemented as under :

"At least, today we have this Road Map which can be used, provided you have no objection to it. This can be used as a main agenda."

3.22. With particular reference to the penal provisions existing in the various Acts, the Committee sought the data for the last 3 years of the actual number of cases filed pertaining to water pollution, the amount of penalties levied and recovered, the number of convictions made, the number of pending cases and other relevant information in the matter. The MoEF thereupon stated that the inventorisation of grossly polluting industries was carried out in consultation with State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs). There were 1055 grossly polluting industries in the Country which generates 9982 MLD effluent. These industries were being inspected through Environmental Surveillance Squad (ESS) of CPCB through random number selection process. The details of inspections carried out under various provisions of the Water Act, 1974 *viz.* under sections 5, 18(1)(b) as well as the details of cases filed in the Courts State/Sector wise during the last three years (2009-2012) is reproduced in tables 3.22(i) to 3.22(vii).

Table 3.22(i) : Inspections by CPCB under ESS Programme

State	Current year	2009-10	2010-11	2011-12

	(Till July 2012)			
Andhra Pradesh	8	11	12	16
Arunachal Pradesh	--	4	--	2
Assam	8	9	16	14
Bihar	--	--	4	6
Chhattisgarh	--	16	8	12
Dadra& Nagar Haveli	--	--	--	--
Gujarat	6	20	14	14
Haryana	8	8	16	4
Himachal Pradesh	--	4	4	--
Jharkhand	--	8	4	2
Karnataka	--	12	4	12
Kerala	4	12	--	12
Madhya Pradesh	--	12	12	20
Maharashtra	10	22	33	32
Manipur	--	1	--	--
Meghalaya	--	3	2	7
Mizoram	--	1	--	--
Orissa	4	5	10	4
Pondicherry	--	--	--	--
Punjab	--	12	8	4
Rajasthan	16	20	27	16
Sikkim	--	3	--	--
Tamil Nadu	4	8	28	8
Tripura	--	--	6	--
Uttar Pradesh	8	16	21	28
Uttarakhand	--	8	--	8
West Bengal	10	33	29	36
Goa	--	--	--	4
Delhi	--	--	--	4

Total	**86**	**248**	**258**	**265**
Grand Total	**857**			

Table 3.22(ii) : No. of Court Cases filed during last three years

As on Date	Total cases filed under Water Act
30-09-2009	6347
30-09-2010	6648
31-12-2010	6729
31-12-2011	6319
30-06-2012	6320

Table 3.22(iii) : Directions issued against Industries during last three years

Year	Section 18(1) (b)	Section 5
2009-10	31	19
2010-11	33	79
2011-12	54	97
Total	**118**	**195**

Table 3.22(iv) : Directions under Section 5 issued State wise during last three years

State	2009-10		2010-11		2011-12		Total
	Only Air	Water/ Water+ Air	Only Air	Water/ Water+ Air	Only Air	Water/ Water+ Air	
Andhra Pradesh		**1**		**3**	**1**	**2**	**7**
Arunachal Pradesh		**1**					**1**
Assam				**4**	**1**	**4**	**9**
Bihar						**2**	**2**
Chhattisgarh	**1**	**2**	**6**	**6**		**4**	**19**
DD & DNH						**1**	**1**
Gujarat				**3**		**3**	**6**

Himachal Pradesh		1				2	3
Haryana		2				1	3
Jharkhand					1	2	3
Kerala	1					1	2
Karnataka				1		1	2
Madhya Pradesh				4		4	8
Maharashtra		1		10		9	20
Meghalaya							0
Orissa					1	2	3
Uttarakhand		1		4		3	8
Punjab		2		2		3	7
Sikkim		2					2
Tamilnadu				2	1	11	14
Uttar Pradesh		3		27		30	60
WestBengal		1		5		4	10
Rajasthan				2	1	2	5
Total	2	17		73	6	91	195

Table 3.22(v) : Directions under Section 5 issued Sector wise during last three years

State	2009-10		2010-11		2011-12		Total
	Only Air	Water/ Water+ Air	Only Air	Water/ Water+ Air	Only Air	Water/ Water+ Air	
CETP		1		2		9	12
Chemical				8		8	16
Brewery		1		2			3
Distillery				15		19	34
Fertilizer				2		2	4
Pulp & paper		7		11		18	36
Petrochemical		1				1	2
pharmaceuticals		4		6		9	19

Sugar				2		7	9
Thermal power plant				8	1	4	13
Tannery		1		6		1	8
Cement	2		2		4		8
Iron & steel		2	4		1	4	11
Dye & dye intermediates				1		1	2
Plywood				1		1	2
Soft drinks							0
Engineering				1			1
Textile				1		1	2
Dairy						2	2
Pesticide				3			3
Slaughter house				2		1	3
Refinery				2		3	5
Total	2	17	6	73	6	91	195

Table 3.22(vi) : Directions u/s 18(1)(b) issued State wise during last three years

State	2009-10		2010-11		2011-12		Total
	Only Air	Water/ Water+ Air	Only Air	Water/ Water+ Air	Only Air	Water/ Water+ Air	
A.P.	1	2		2	1	2	8
Assam		1	1	1			3
Chattisgarh	4	2					6
Gujarat		1		1		3	5
Haryana		1		1		1	3
Jharkhand	2	1			2	2	7
Kerala		1		1		1	3
Karnataka				1		2	3
M.P.	1				1	4	6
Maharashtra		2		8	2	7	19

Meghalaya	**1**						**1**
Orissa		**1**	**1**	**1**		**1**	**4**
Uttarakhand				**4**		**1**	**5**
Punjab		**3**		**1**		**1**	**5**
Sikkim		**1**					**1**
Tamilnadu		**1**		**4**		**8**	**13**
U.P.		**3**		**2**	**1**	**7**	**13**
W.B.	**1**	**1**	**1**	**1**	**1**	**3**	**8**
Rajasthan				**2**		**3**	**5**
Total	**10**	**21**	**3**	**30**	**8**	**46**	**118**

Table 3.22(vii) : Directions u/s 18(1)(b) issued Sector wise during last three years

Sector	**2009-10**		**2010-11**		**2011-12**		**Total**
	Only Air	**Water/ Water+ Air**	**Only Air**	**Water/ Water+ Air**	**Only Air**	**Water/ Water+ Air**	
CETP		**2**		**1**		**5**	**8**
Chemical		**2**		**4**		**3**	**9**
Distillery		**2**		**1**		**1**	**4**
Fertilizer		**2**		**1**			**3**
Foam making		**1**					**1**
Pulp & paper		**5**		**4**		**2**	**11**
Petrochemical		**1**		**1**		**1**	**3**
Pharmaceuticals		**1**		**4**		**7**	**12**
Sugar		**2**		**4**		**10**	**16**
Thermal power plant		**1**			**1**		**2**
Tannery		**2**	**3**	**4**	**1**	**7**	**17**
Cement	**3**				**4**		**7**
Iron & steel	**7**					**4**	**11**
Dye & dye				**3**			**3**

intermediates							
Plywood				**1**			**1**
NGRBA				**2**		**5**	**7**
Soft drinks							**0**
Stone crushers					**2**	**1**	**3**
Total	**10**	**21**	**3**	**30**	**8**	**46**	**118**

3.23. The Committee was informed that Ministry is considering raising the limit of fine/ penalty from the present level. On being asked as to whether the Ministry have data on fine/ penalty levied under these Acts for last 10 years, it was informed that the Fine/Penalty was imposed and levied by the courts in the Country and the Ministry has no data on fines collected by various courts.

3.24. On a further specific query as to whether the present penalty and fine provisions were being enforced effectively, the MoEF replied that the present penalty and fine provisions were being enforced by courts.

3.25. On being asked as to whether there has been any study undertaken for enhancing penalties/fine, the MoEF stated that there was no proposal to enhance the penalty and fine stipulated in various acts for violation of the Water (Prevention and Control of Pollution) Act etc. and no study has been conducted in this regard.

3.26. On being asked as to the prescribed system of taking punitive action against the defaulting units that discharge harmful effluents into the rivers, the MoEF stated that punitive action against the defaulting units that discharge harmful effluents and do not meet discharge standards are taken by respective State Pollution Control Board & Central Pollution Control Board through inspections, surprise checks and issues show cause notice and / or closure notice.

3.27. The Committee further sought to know whether there was any proposal to endow legal entity status for common effluent treatment plants to facilitate investments and enable enforcement of standards. In reply thereto, the MoEF stated that the small scale industries located in clusters or industrial eStates/ industrial areas form an Association and get it registered under the Societies Act for availing Central Government/ State

financial grant for the construction of Common Effluent Treatment Plant (CETP). The Banks too, provide soft term loans to such registered societies for construction of CETP. The Society so formed, run the CETP and operate and maintain it on “no profit no loss basis." The members of the Society share the cost of the Operation & Maintenance (O & M). Each member pays an amount which was proportionate to the volume of waste water or pollution load contributed to CETP for treatment. The Association so registered under the Societies Act was liable to be prosecuted under the Water (Prevention and Control of Pollution) Act, 1974 for non compliance of discharged standards. The CETP Company was also required to obtain environmental clearance under Environment Impact Assessment (EIA) Notification of 2006.

3.28. On being asked to elaborate the reforms that were urgently required to be put in especially to face the enormous challenge of water pollution in India, the MoEF stated that the reforms which were urgently required relate to handling of enormous quantity of sewage and industrial effluents. These were the two major cause of problem of pollution of rivers and lakes in the country. With the available resources, it was not possible to provide treatment capacity for sewage as well as industrial effluents. The sewage treatment capacity was being augmented in metro cities and also cities/ towns which are directly discharging untreated or partially treated sewage into rivers. However, with ever growing population and proportionate increase in sewage generation, it will not be possible for the State to provide 100 % sewage collection and treatment facility in each and every town in the country. The cost of installation of sewage collection and treatment facilities was not one time expenditure but such facilities are required to be maintained in top operating condition to enable treatment at optimum efficiency which entails recurring expenditure. The treatment facilities require trained manpower for proper operation and maintenance. There was acute shortage of trained manpower in this area. The treatment of industrial effluents in large and medium industries was taken care of by industries themselves. However, to take care of regular maintenance and upgradation of technology with respect to changing time and prescribed discharge norms they were required to install better technology and also upgrade it at regular interval. The industries find it difficult, at times, to comply with changing regulatory requirement, unless financial assistance is extended to them. In this regard it may be suggested that separate banking facility may be created for unhindered credit flow for environment related projects which will ensure protection of environment and conservation of rivers, lakes, wetlands etc.

3.29. The Ministry further submitted that Government of India started funding common effluent treatment plants with the financial assistance made available by the World Bank. Several CETPs were installed for small scale industries located in clusters, industrial areas and industrial States. An exclusive financial institution may be envisaged to cater to the ever increasing demand of funds for funding sewerage and industrial pollution control related projects. The credit flow for conservation projects will ensure private participation and planned execution of sewerage related projects in all towns and cities irrespective of their size and location. The time targeted action plan for each river basin may be implemented only if uninterrupted credit flow is made available. This will help not only conservation of rivers but also O & M of facilities, development of water resources and public private participation. At present, return on investment was not so attractive so as to attract private funds or foreign equity. The situation may be changed by employing two sets of actions, one, financial incentive and two, legislative supports. The investment on sewerage facility may also be made attractive if Government provides land for installation of sewage treatment facility, initial funds required for O & M of sewerage facilities, Tax holidays for say 10 years, and tax benefits for investment on sewerage facilities, market supported by legal framework to utilize treated sewage, industrial effluents, sludge, biogas, etc.

3.30. It was also submitted that some major proposals for reforms viz. private participation for facing the challenge of providing facility for sewage collection and its treatment in each and every city and town, funds for sewerage facility from State Government/ Central Government in every town/city Municipality by law for mandatory reuse of treated sewage for toilets, irrigation etc for which dual plumbing may be made in the housing sector; and at the National level, a designated single agency to deal with sanitation sector.

3.31. It was further submitted that the SPCBs and PCCs do not have adequate wherewithal to monitor all sources of pollution in the State/UTs and for non compliance with discharge standards, to take legal action against polluter and follow it up to its logical conclusion. The sewage management and industrial pollution control was being carried out as per the following:

- Local bodies/Water & Sewerage boards/Public health Engineering departments: Install water and sewerage infrastructure for water distribution, sewage collection and treatment. Most of the STPs do not function properly largely due poor financial conditions and inadequate trained manpower.
- Industrial pollution control: Individual industries provide pollution abatement measures and obtain permission under the Water Act 1974 for discharge in to water bodies. The SPCBs in turn monitor their performance and non compliance with discharge standards attract penal action under the Water Act, 1974. In case of SSI units, common effluent treatment plant is installed for industrial areas/EStates and clusters of industries with the financial assistance from Central and State Govts. The SPCBs also monitor their performance and non compliance with discharge standards attract penal action under the Water Act, 1974; and
- The State Pollution Control Boards and Pollution Control Committees in UTs regulate discharge of treated sewage and industrial effluents in the surface water bodies as per the provisions of the Water Act 1974.

3.32. The Committee were informed that adequate safeguards have been provided under the Water Act, 1974 as well as the Environment (Protection) Act, 1986 for prevention and control of water pollution. The existing regulations have been amended from time to time to accommodate new situations. In this connection, the Committee asked the MoEF to justify the failure to abate pollutions of water bodies assertion was that the extant legislative and regulatory framework was adequate for prevention and control of Water pollution. The Ministry thereupon replied that there were a large number of stakeholders viz. Ministry of Power, Ministry of Agriculture, Ministry of Water Resources, Ministry of Urban Development, Ministry of Chemicals & Fertiliser, Animal Husbandry Department, Municipalities, Irrigation Department and Department of Fisheries Development and coordinated efforts were required from each stakeholder. Besides, pollution load was increasing in geometric progression whereas treatment capacity was increasing in arithmetic progression due to limited resources made available to handle the pollution load generated.

3.33. The Committee further sought to know whether the shortcoming was at the enforcement level then. The MoEF agreed that there was need for organizational

strengthening and capacity building to improve the level of enforcement. Capacity building and organizational strengthening are ongoing activities of the Ministry but State Government should also chip in efforts to maintain the optimum level of efficiency and the State Pollution Control Boards should monitor sources of pollution in the States supplemented by adequate and prompt action against polluters. The large industries were required to install automatic monitoring stations; small industries cannot afford to monitor sources of pollution individually whereas Common Effluent Treatment Plants do install automatic monitoring stations. However, due to funds constraints it was not possible to install automatic water quality monitoring equipments on each water stream. The State Pollution Control Board has water quality monitoring programme under which regular monitoring of water stream was carried out. But due to limited resources available, frequency of monitoring was very low (often once a month).

3.34. The MoEF further submitted that the State Government need to provide adequate manpower and resources, arrange for their training, provide well equipped laboratory with latest monitoring sampling equipments, devise and develop new programmes and methodology for prevention and control of pollution in the State. A proper man power development programme should be put in place to take care of their training and development needs. The industries too are facing the problem of scarcity of trained manpower which results in improper O & M of pollution abatement infrastructure. At times, due to lack of coordination amongst various organizations, pollution of surface water and ground water goes on unabated. The small towns, where there are no arrangements for collection and proper disposal of solid waste, generally dump it in the river, resulting into pollution of river. Often, human settlements are allowed to develop on the bank of rivers which causes pollution of river. The local bodies, Water supply and drainage department, Nagar Nigam, Municipality, City Development Authority, City Improvement Trust, Housing Board, Slum Improvement Department, etc work at cross purposes. There is a plethora of rules and regulations which hamper not only development but also encourage mushrooming of slums, littering of solid waste and dumping it in rivers or drains.

3.35. It was also submitted that the city development plan was never adhered to by the local authorities to accommodate changing needs of people and growing town. There was no interface between common man and Government Agencies which led to mismatch at times with respect to planning of activities for city/town development. The involvement of

people in maintenance of city/ town sanitation, solid waste management, river front development, education of people, etc. are not one time activity but ongoing programme which should be taken care of at city/ town level. The State agencies, often do not have adequate resources at their disposal to carry out basic functions related to Mass Awareness Programmes, sanitation, etc., In addition to above, real time monitoring of sources of pollution and prompt action against polluters was also equally important but inordinate delay in filing court cases and taking it to logical end also an important impediment in the whole process for prevention and control of pollution. However, Central Pollution Control Board, State pollution Control Board and Pollution Control Committees have introduced several amendments and modifications in the way inspections were being carried out by their team to make it more effective and result oriented. The joint inspection by a team of Scientists and Engineers from both Central Pollution Control Board and State Pollution Control Board /Pollution Control Committees, sharing of data and inspection report, surprise inspection of industries, etc. are some of the measures initiated by the MoEF through the Central Pollution Control Board.

CHAPTER - IV

POLICY FRAMEWORK

4.1. Strong policy framework is an essential first step in effectively regulating water quality. Audit scrutiny pointed out that although the concerns related to water pollution have been adequately addressed in National Water Policy and National Environment policy in India, both at the central and the State level, provisions for generation of resources for prevention of pollution, treatment of polluted water and ecological restoration of polluted water bodies are not adequate. Audit findings also pointed out that lack of a comprehensive approach has often led to costly and ineffective water policies. Good and enforceable regulations must follow creation of an overall water quality policy.

4.2. The National Water Policy was adopted in 1987 and was reviewed and updated by the Ministry of Water Resources in 2002. This policy aimed at meeting the challenges that have emerged in the development and management of water resources including water pollution. The salient features of National Water Policy relating to water pollution envisages *inter-alia* regular quality monitoring of both surface water and ground water

for a phased programme for improvements in water quality; treatment of effluents to acceptable levels and standards before discharging them into natural streams; maintenance of minimum flow in the perennial streams for ecology and social considerations; principle of 'polluter pays'; necessary legislation for preservation of existing water bodies for prevention of encroachment and deterioration of water quality; for maintenance of water resource schemes under non-plan budget, and generally institutional arrangements need for improvements in existing strategies, innovation of new techniques on strong science and technology base for elimination of pollution of surface and ground water resources to improve water quality; and importance of Science and technology and training in water resources development and management with emphasis on water quality, recycling and re-use of water.

4.3. The 2006 policy deals with water quality pointing out that improvement in existing strategies and innovations were needed to eliminate pollution of surface and ground water resources and also states that resources should be conserved and availability augmented by maximising retention, eliminating pollution and minimising losses. Thus, addressing water pollution was one of the thrust areas of the National Water Policy and the Environment Policy. In June 2011, MoEF stated that the National Environment Policy declared by MoEF in 2006 briefly described the key environmental challenges currently and prospectively facing the country, the objectives of environment policy, the normative principles underlying policy action, strategic themes for intervention, broad indications of the legislative and institutional development needed to accomplish the strategic themes and mechanisms for implementation and review.

4.4. The National Environment Policy outlines a significant number of new and continuing initiatives for enhancing environmental conservation. A formal, periodic high level review of implementation of the different elements of the National Environment Policy was essential at least once a year. The findings of the review should be publicly disclosed, so that stakeholders are assured of the seriousness of the Government in ensuring implementation of the Policy. However, audit pointed out that no such review has taken place. Audit findings further pointed out that the National Water Policy, 2002 also envisaged that within a time bound manner, say a period of two years, States would frame and adopt State Water Policy. With respect to

State water policy formulations, it was observed that 18 States have framed water policy and in the remaining seven States, water policy was yet to be finalised. Only Kerala formulated a separate policy to deal with water pollution. Further water policy of most of the States also does not give adequate emphasis on prevention and control of water pollution. The policy of the State Government of Kerala addresses pollution issues by stating that "There shall be specific plan of action for implementing location specific sewerage in all urban areas and appropriate sanitation system in all rural areas. Appropriate sanitation sub policy and action plan shall be formulated and implemented. The potential for recycling and reuse of water shall be recognized and all water users shall be directed to adopt measure to recycle for incremental reduction in water extraction."

4.5. Asked which States other than the State Government of Kerala has formulated a separate policy for water pollution, the MoEF replied that Maharashtra and Goa have notified water policy. Chattisgarh has formulated and notified ground water policy for its development and control. There was a need for other States also to formulate a clear policy on water pollution taking into account prevention and control of water pollution as well as ecological restoration of degraded water bodies.

4.6. The MoEF further submitted that sustainability was key to success of such programs and States are being encouraged to adopt effective and user- friendly technology, sustainable model of revenue generation. Urban Local Bodies (ULBs) were also being involved since conceptualization of a project as they were the custodian of assets.

4.7. The Ministry of MoEF has also prepared new guidelines for preparation of detailed project reports (DPRs) under NRCP/NGRBA for funding of sewerage projects. The guidelines envisage that DPRs should have detailed plan for reuse and recycling of treated sewage. Without such a plan, DPR would not be considered for funding sewerage projects. Project implementing agencies/ ULBs are also encouraged to avail several other good practices including use of Biogas for power generation. The digested sludge generated may be used as soil conditioner. Also treated effluent may be used for irrigation, etc.

4.8. On a further query as to whether in the recent past, the matter was taken up by the Ministry with these States the MoEF replied that to give a fresh impetus to the river conservation programme in the country, the 'National Ganga River Basin Authority' has been set up on 20.2.2009, as an empowered planning, financing, monitoring and coordinating body to ensure effective abatement of pollution and conservation of the river Ganga by adopting holistic approach, with the river basin as the unit of planning. It was further submitted that the issues are also taken up with the State Government at highest level i.e. at Chief Secretary / Administrators of UTs and Chief Ministers level and also with the project implementing agencies, the urban local bodies, etc, which are the ultimate custodian of the assets created for their proper operation and maintenance.

4.9. The Committee asked the MoEF to elaborate whether any formal, periodic high level reviews of implementation of the different elements of the National Environment Policy was being proposed by MoEF. In reply thereto, the MoEF stated that they have sanctioned sewerage schemes to various State Governments and these schemes were periodically reviewed by the Project Director, an Additional Secretary rank officer in the GOI, for compliance with respect to approved time schedule and cost of the project. The Scientists also visit the project sites and review the progress of the project with the officer concerned from the implementing agency and the State Government. The shortcomings are then communicated to the State Government as well as the project implementing agency. The accumulated experience gained over the years and also the observations of the international funding agencies has led to review of the guidelines prepared for DPR preparation. The periodic review of projects had also enabled involvement of ULBs, Implementing agencies and the State Government along with the NRCD by signing memorandum of agreement, evaluation of proposals by outside agencies, third party inspections, etc. The revised guidelines provided for preparation of City Sanitation plan, feasibility report, etc. before any scheme was posed to the NRCD for funding. The proposed project for funding should be selected for preparation of detailed project report (DPR) after preparation of city sanitation plan, prioritization of various projects, preparation of feasibility reports and selection of appropriate technology, etc.

4.10. In the context of water policy, the Secretary MoEF submitted during evidence that Water Policy from the Central Government side was originally issued in 2002 by the Ministry of Water Resources and updated in 2012. The Water Policy included the quality of water, quantity of water and eco-flows at the national level. He further supplemented that the MoEF was doing only quality monitoring of 1700 stations and eco-flows was something on which they have nothing to say. On further being asked as to who decides about the eco-flow, the Secretary replied that it was the Ministry of Water Resources. It was further submitted that the Ministry of Water Resources and MoEF were Members of this Water Quality Assessment Authority.

4.11. The Committee were informed that State Government of Kerala, Maharashtra, Goa and Chattisgarh have formulated and notified ground water policy for its development and control and there is a need for other States also to formulate a clear policy on water pollution taking into account, prevention and control of water pollution as well as ecological restoration of degraded water bodies. The Ministry of Environment and Forests acts as a catalyst for achieving desired outputs as enshrined in the Environment Policy and guides the States to formulate transparent methodologies, procedures, and strategies with adequate public participation and well supported by rules and regulations for water pollution control in the country. It was further submitted that the State Governments have already formulated water policies. Some of them have also included water pollution as part of Water Policy of the State. However, there was need to reorient development policy of the State and align it with the Water Policy for water Pollution control.

4.12. On being asked about the steps taken for emulation of successful water policy models, the MoEF submitted that the Ministry of Water Resources had circulated a Model Bill to the States and Union Territories to enable them to enact suitable legislation for regulation and control of ground water development and management. At present 14 States have enacted the ground water bill based on Model Bill and another 16 States have taken initiative for enactment of model bill. The Central Ground Water Board, Ministry of Water Resources is pursuing with the respective state Governments for early enactment of the Ground Water Bill based on the Model Bill.

4.13. The names of the States which have enacted the model legislation for regulation and control of ground water are given below :

(I) Table 4.13(i) : Model Bill for Regulation and Control of Ground Water enacted and implemented

Sl. No.	States/UTs	Sl. No.	States/UTs
1.	Andhra Pradesh	8.	Lakshadweep
2.	Bihar	9.	Puducherry
3.	Chandigarh	10.	Tamil Nadu
4.	Dadra & Nagar Haveli	11.	West Bengal
5.	Goa	12.	Jammu & Kashmir
6.	Himachal Pradesh	13.	Karnataka
7.	Kerala	14.	Assam

(II) Table 4.13(ii) : Model Bill for Regulation and Control of Ground Water initiated

Sl. No.	STATES/ UTs	Sl. No.	STATES/ UTs
1.	Maharashtra	9.	NCT Delhi
2.	Gujarat	10.	Jharkhand
3.	Haryana	11.	Meghalaya
4.	Mizoram	12.	Madhya Pradesh
5.	Orissa	13.	Uttaranchal
6.	Rajasthan	14.	Andaman & Nicobar
7.	Uttar Pradesh	15.	Chhattisgarh
8.	Daman & Diu	16.	Punjab

4.14. On the suggestions made by the MoEF for the National Policy on Water, the Secretary MoEF deposed as under :

> "From our side on the water pollution quality side, we have suggested some things. We have also suggested certain measures in regard to tremendous extraction, which is happening on the major rivers mainly for agriculture and irrigation, which is not metered and which is not measured and nor is it controlled by the State Governments.... The concentrations of pollution increase in the water. Every bit of surface water gets polluted because of lack of dilution rather than excessive pollution." Another very major aspect, which has to be insisted upon, is that the eco-flows are maintained."

4.15. He further supplemented :

"Our Kerala Water Policy is an excellent document. That has been partly copied but it has also been localised. Maharashtra and Goa have also their State level Water Policy. Water being a State subject, a National Water Policy is being prepared by the Ministry of Water Resources and State policies are prepared, which are much localised and much more related to their local conditions. So, this Kerala model is actually taken partly by Maharashtra and Goa. Chhattisgarh has also developed a State level policy but that is mostly for ground water being a landlocked State."

4.16. The Secretary also highlighted the desalination project undertaken by the Government of Tamil Nadu. This project could be extended to all the Coastal States for supply and meeting the demand of potable water. Tamil Nadu Government is planning to cover the whole of Chennai with this project. Moreover, with the use of reverse osmosis technology, the price of converting one litre of water has drastically come down, thereby making it affordable.

4.17. The Road Map of the MoEF lists the following recommendations on Policy framework :

- An amendment to the Environment (Protection) Act of 1986 is proposed to address various important issues in environmental management, such as hike in penalties for contravention of its provisions, a civil administrative adjudication system to ensure fast-tracking of the imposition of penalties on environmental offenders, provision for furnishing suitable bank guarantees for specific performance and for restoration of the damaged environment. It is also proposed to establish a National Environmental Appraisal and Monitoring Authority (NAEMA) to carry out environmental appraisals and monitoring of compliance conditions. This may be expedited.
- Mostly insecticides and pesticides are used in agriculture activity. The enforcement of pollution control laws for such activities leading to diffused pollution is difficult. This can be better tackled through judicious use of pesticides and insecticides in agriculture. The National Environment Policy also recommends to take explicit account of groundwater pollution in pricing policies of agricultural inputs, especially pesticides, and dissemination of agronomy practices. Encourage Integrated Pest Management (IPM) and use of biodegradable pesticides. Ministry of Agriculture

may continue the ongoing programme of Integrated Pest Management (IPM) and Farmers Field School (FFS) under IPM in a bigger way to address the issue.

- State Government may ensure to check the encroachment of the flood plains.
- The National Environment Policy is intended to be a guide to action: in regulatory reform, programmes and projects for environmental conservation. The agencies of the Central, State, and Local Governments, therefore, need to take appropriate steps for review and enactment of legislation in a time bound manner.
- Bureau of Water Efficiency (BWE) under the Ministry of Water Resources is being set up on the lines of the Bureau of Energy Efficiency, set up by the Ministry of Power. The bureau will stipulate that machines consuming water sport a water efficiency label just as energy efficiency labels are put up on air-conditioners. The government may give incentives to farmers or industrialists if they follow good water-efficient methods.
- Enhance capacities for spatial planning among the State and Local Governments, with adequate participation by local communities, to ensure clustering of polluting industries to facilitate setting up of common effluent treatment plants, to be operated on cost recovery basis. Ensure that legal entity status is available for common effluent treatment plants to facilitate investments, and enable enforcement of standards**.**
- Take explicit account of groundwater pollution in pricing policies of agricultural inputs, especially pesticides, and dissemination of agronomy practices. Encourage Integrated Pest Management (IPM) and use of biodegradable pesticides.
- Conservation of water bodies and the Issues related to their encroachment fall within the domain of the respective State Governments. However, administrative requirements contained in the National Lake Conservation Programme (NLCP) guidelines call upon the project proponents to take necessary steps for declaring the lake boundary through a Government order; to ensure removal of encroachments in the lake submergence area/lake boundary; to consider for notifying the ‘Establishment of a Bio-conservation Zone’ around the water body for better safeguard of lake surroundings from the growing pollution potential and the encroachments
- For effective use of water resources, Ministry of Agriculture should standardize/define the landuse for different crops in each region. Good practices in water usage should be replicated. To check the contamination of runoff from the

agricultural fields, a clear cut policy needs to be evolved by Ministry of Agriculture for use of pesticides. In this regard use of bio-fertilizers and bio-pesticides should be encouraged.

- Integrated water resource management to conserve water, minimize wastage and ensure more equitable distribution both across and within States should be encouraged. Through regulatory mechanisms with differential entitlements and pricing, considerable share of the water needs of urban areas can be met through recycling of waste water.
- Water requirements of coastal cities with inadequate alternative sources of water can be met through adoption of new and appropriate technologies such as low temperature desalination technologies that allow for the use of ocean water.

4.18. The National Water Policy, 2012 was adopted by the National Water Resources Council on 28 December, 2012. The objective of the Policy is to take cognizance of the existing situation, to propose a framework for creation of a system of laws and institutions and for a plan of action with a unified national perspective. On the aspect of Water Framework Law, the National Policy states that even while it is recognised that States have the right to frame suitable policies, laws and regulations on water, there is a felt need to evolve a broad over arching national legal framework of general principles on water to lead the way for essential legislation on water governance in every State of the Union and devolution of necessary authority to the lower tiers of Government to deal with the local water situation. The policy takes into recognition the present critical scenario in the management of water resources and *inter-alia* highlights large parts of the Country remaining water stressed due to rapid growth in demand for water due to population growth, urbanisation and changing lifestyle posing serious challenges to water security; inadequate water governance and mismanagement; skewed availability of water with wide temporal and spatial variations; unsustainable and over-exploitation of Groundwater; implementation of water related projects though multi-disciplinary, in a fragmented manner leaving a dent on optimum utilisation of existing institutions, environment sustainability and holistic benefit to the people; growing pollution of water sources through industrial effluents as well as inadequate sanitation and lack of sewage treatment affecting availability of safewater besides causing environmental and health hazards; wastage and inefficient use of water due to low public consciousness about the overall scarcity and economic

value of water; lack of trained personnel for scientific planning, utilizing modern techniques and analytical capabilities incorporating information technology constraining good water management; absence of a holistic and inter-disciplinary approach to water-related problems; decision making without adequate consultation with stakeholders often resulting in poor and unreliable service characterised by inequities of various kinds, etc. The policy recognises the need for comprehensive legislation for optimum development of inter-State rivers and river valleys to facilitate inter-State coordination ensuring scientific planning of land and water resources taking basin/sub-basin as unit with unified perspectives of water in all its forms (including precipitation, soil moisture, ground and surface water) and ensuring holistic and balanced development of both the catchment and the command areas. Such legislation needs, inter alia, to deal with and enable establishment of basin authorities with appropriate powers to plan, manage and regulate utilization of water resource in the basins. As regards institutional arrangements, the Policy states that there should be a forum at the national level to deliberate upon issues relating to water and evolve consensus, co-operation and reconciliation amongst party States. A similar mechanism should be established within each State to amicably resolve differences in competing demands for water amongst different users of water, as also between different parts of the State. Integrated Water Resources Management (IWRM) taking river basin/sub-basin as a unit, should be the main principle for planning, development and management of water resources. The departments/organisations at Centre/State Governments level should be restructured and made multi-disciplinary accordingly. On the implementation aspect of the National Water Policy, the policy stated that National Water Board should prepare a plan of action based on the National Water Policy, as approved by the National Water Resources Council, and to regularly monitor its implementation. The State Water Policies may need to be drafted/revised in accordance with this policy keeping in mind the basic concerns and principles as also a unified national perspective.

CHAPTER - V

INSTITUTIONAL ARRANGEMENTS FOR MANAGING WATER POLLUTION IN INDIA

5.1. Audit Report pointed out that at the Centre, the various agencies responsible for policy-making, implementation and Monitoring were as under :

Table 5.1 : Institutional Arrangements for Managing Water Pollution Control Programmes

Policy-making	Implementation	Monitoring
• For river/lake pollution: Ministry of Environment & Forests (MoEF), Central Pollution Control Board (CPCB) • For Ground water pollution: Ministry of Environment & Forests (MoEF), Ministry of Water Resources (MoWR) Central Ground Water Board (CGWB)	• For River/Lake Pollution: National River Conservation Directorate • For Ground water : MoEF, MoWR	• For River/lake Pollution : NRCD/CPCB • For ground water pollution : CGWB • Water Quality Assessment Authority

5.2. In the States, specific programmes for river or lake pollution control, abatement or restoration of quality through NRCP/NLCP are executed through different State Government Departments. These vary from State to State. In most States, the responsibility of control of water pollution was assigned to State Pollution Control Boards and not specifically to State Government Departments.

5.3. Audit findings pointed out that CPCB and SPCBs were autonomous of each other. While CPCB was under the administrative control of the MoEF and responsible for overall policy, planning and coordination, the SPCBs were under their respective State Governments and were expected to work under the overall policy framework of CPCB,

MoEF and responsible for implementation of provisions of various environmental Acts relating to Water pollution at the ground level. This dichotomy of control finds its source in the Water (Prevention and Control of Pollution) Act, 1974, which further entrusts the SPCB with the critical functions of compliance to and enforcement of pollution control related activities, whereas CPCB was given an advisory and coordination role. SPCBs were not empowered to generate adequate financial resources of their own to effectively discharge their mandate and were dependent on Central Government and State Government for grants even for expenditure on normal monitoring of pollution levels. Thus, while the outputs of the actions of CPCB and SPCBs were co-related, there was no functional co-relation between them at the input stage. This dichotomy of control causes a situation whereby there was no single agency to take charge of the issue of control of water pollution on a nation-wide basis.

5.4. The Secretary, MoEF conceded that there was want of requisite cooperation between the Union and States. He also referred to the problem between sanitation and industrial pollution. He further deposed :

> "....institutions are working in silos. They are not cooperating because of these two laws. The second problem is that who will pay."

5.5. He further supplemented on this issue:

> "...the main point I want to underline here is that there is need for a coordinating body to start pulling in these measures and using this book (Road Map) as the first agenda. After that, this can be prioritised and made into smaller modules."

5.6. The Committee were informed that a Working Group was constituted during the 56th Conference of Chairmen and Member Secretaries of SPCBs / PCCs on “Strengthening of Information Technology in CPCB / SPCBs / PCCs and Water Cess” which reviewed the implementation of Water Cess Act and inter-alia recommended enhancement of Cess rates, online measurement of water flow to be installed by all industrial units and incentives should be given in the form of rebates, if the units practices cleaner technology and sound environmental management system, imposition of Penalty to be doubled, if the industrial unit exceeds the stipulated specific consumption of water. On being asked, the MoEF submitted that the Central Pollution Control Board had submitted Working Group Report on “Revision of Water Cess” to enhance the rate of water cess to the MoEF, which was currently under examination.

5.7. On the punitive penalties for violation of provisions of the Water Act, the MoEF submitted that the relevant provisions in the Act provide that if any amount of cess payable by any person carrying on any specified industry or any local authority under section 3 of the Water (Prevention and Control of Pollution) Act, 1977 was not paid to the State Government within the date specified in the order of assessment made under section 6 , it shall be deemed to be in arrears and the authority prescribed in this behalf may, after such enquiry as it deems fit , impose on such person or, as the case may be , local authority, a penalty not exceeding the amount of cess in arrears, provided that time is given to such person or authority of being heard. Whoever furnishes wrong or false returns under this Act shall be punishable with imprisonment which may extend to six months or with fine which may extend to one thousand rupees or with both.

5.8. The Committee further sought to know the current level of preparedness of industrial units in terms of cleaner technology and sound environmental management system for availing the proposed incentives and rebates as per the aforesaid draft report of the Ministry of Environment and Forests was under examination in the Ministry. However, action plan to use cleaner technologies or reduction in waste has been under implementation in some sectors viz. Pulp & Paper, Distillery, Sugar Chemical and CETP & STP; Installation of Chemical Recovery Unit in agro based industry; Introduction of Biological Treatment Plant in waste paper based industry; Improved pulp washing system; Reuse and Recycle of treated effluent; Introduction of anaerobic treatment followed by Reverse Osmosis process for recovery of water (permeate) and disposal of waste water (rejects); Installation of Multi Effect Evaporator and/or use of bio-composting for disposal of rejects; Disposal of treated effluent on land for irrigation and introduction of Zero Liquid Discharge were some of the initiatives taken in this regard.

5.9. On the aspect of online measurement of water flow by all industrial units, the Committee was apprised that the online measurement of water can be ensured by a comprehensive setup to install depth sensors in the channel with a Closed Circuit TV (CCTV) and transmission of measurement through dedicated telecommunication system to State Pollution Control Boards/Pollution Control Committees and Central

Pollution Control Board for instant checking and scrutiny. Such a measurement system shall be maintained by a dedicated trained personnel in State Pollution Control Boards/Pollution Control Committees and Central Pollution Control Board or through outsourcing.

5.10. The Committee were informed that the possibility to inspect all the large and medium scale industries and the sources of pollution was once a year. The Ministry admitted that the same is not adequate to assess the compliance of prescribed standards. There was a need to strengthen SPCBs in terms of manpower and laboratory setup for improvement in periodicity of inspection. On being asked as to whether the constraints faced by SPCBs in terms of manpower and laboratory set up have been identified, the Committee were apprised that the Committee/Institution on manpower issue was constituted by Central Pollution Control Board and the report on that was available.

5.11. On the question of ideal periodicity of inspection for industrial pollution so as to enable adequate assessment of complaints of prescribed standards, the MoEF submitted that the industrial effluents should be monitored regularly and instantly through online monitoring mechanism. The periodicity of inspection in respect of grossly polluting units should be as frequent as possible whereas in case of moderately or non polluting units should be inspected at least every three months.

5.12. CPCB was envisaged to be a technical and regulatory body. However, now CPCB has also become a fund-sanctioning authority. Further, CPCB has no control over the functioning of SPCBs. Given the serious and inter-state nature of water pollution and the weak levels of existing deterrence, the Committee sought to know whether the MoEF envisages setting up of a separate regulatory body which sets standards, enforces the standards set and takes recourse to remedies in the event of violations of the standards. The Ministry thereupon submitted that the Central Pollution Control Board (CPCB) was not a fund sanctioning authority. Most of their budget was utilized for monitoring of Air quality, water quality and inspection of industries, etc. They only reimburse the expenditure (fixed rate basis, capital + O & M) incurred by the monitoring agency like SPCB and others institutions, for O & M of monitoring stations. The Central Pollution Control Board also carries out several field

investigations jointly with State Pollution Control Boards/Pollution Control Committees for which expenditure is again reimbursed to the State Pollution Control Boards/Pollution Control Committees. The Central Pollution Control Board had been performing the work assigned to it under various Acts for prevention and control of water pollution and no such proposal for setting up of a separate regulatory body, was under consideration of the Ministry at this stage.

5.13. On being asked as to whether the MoEF had ever considered entrusting the monitoring of water quality to reputed third party agencies like IITs to independently monitor a process which was not being done in a satisfactory manner by CPCB/SPCBs. The Committee were apprised that the monitoring of water quality can be strengthened with adequate funding, adequate manpower and adequate infrastructural facilities to fulfil the requirements of comprehensive assessment. The third party agencies like IITs may not have regular manpower to undertake such type of monitoring activities and to cover the entire nation's aquatic resources.

5.14. The Ministry was asked to explain their stand on the observation made by audit that the CPCB/MoEF did not compile any information on cases of violations relating to water pollution filed by SPCBs and the amount of fine realized. The Ministry thereupon replied that the information on polluting sources including industries is compiled under the activities of Environmental Surveillance Squad and directions are issued to defaulters. There were 1055 Grossly Polluting Industries and the total effluent generation was of the order of 9982 MLD.

5.15. The Committee sought to know whether the existing system of inspection by SPCBs was adequate or required to be strengthened, the MoEF replied that under the Water (Prevention and Control of Pollution) Act, 1974, State Pollution Control Board at State level had been entrusted with the responsibility of prevention and control of water pollution. The control of pollution was governed by Consent management in respect of industries through State Pollution Control Boards. With respect to pollution of surface water and groundwater by municipal sewage and solid waste, urban water bodies were being persuaded to collect and treat the municipal wastewater before disposal and to develop sanitary landfill sites for Municipal solid waste. The staffing for inspection and follow up actions was highly inadequate. The possibility to inspect all

the large and medium scale industries and the sources of pollution was once a year which was not adequate to assess the compliance of prescribed standards. There was need to strengthen SPCBs in terms of manpower and laboratory setup for improvement in periodicity of inspection.

5.16. On a pointed query as to whether the Ministry was satisfied with the institutional arrangements with regard to review of water pollution at the Centre and in the States, the MoEF submitted in their written reply that the State Pollution Control Boards and Pollution Control Committees in the Union Territories had been constituted under the Water (Prevention and Control of Pollution) Act, 1974 to implement the rules and regulations pertaining to prevention in control of water pollution in the State. The Central Pollution Board had been constituted under the same Act to plan and execute nationwide programme for environment protection in the Country with the help of SPCBs and Pollution Control Committees. Adequate safeguards had been provided under the Water Act, 1974 as well as the Environment (Protection) Act, 1986 for prevention and control of water pollution. The existing regulations had been amended from time to time to accommodate new situations.

5.17. The Committee sought to know the manner in which the Ministry exercises their power over various agencies including SPCBs, which were under the respective State Government. The MoEF replied that under the provisions of Environment (Protection) Act, 1986 powers have been delegated to the State Govt. as well as the CPCB to direct any agency, institutions, industries, etc. for taking necessary steps for protection of environment including closure of manufacturing process of industries, institutions etc. The CPCB had been empowered to issue directions under the existing provisions of the Water Act, 1974 to the SPCBs and pollution control committee to take specific action against industries or institutions etc. for protection of environment.

CHAPTER - VI

WATER QUALITY ASSESSMENT AUTHORITY (WQAA)

6.1 The Water Quality Assessment Authority (WQAA) was set up at the central level in May, 2001 for exercising powers under the Environment Protection Act, 1986. The Authority is equipped to issue directions for protection and conservation of the environment and preventing, controlling and abating pollution and to direct agencies (government/ local bodies/non-governmental) in the field of water pollution. The Authority is mandated to direct agencies to standardize water quality monitoring methods, ensure proper treatment of waste water to restore the quality of surface and ground waters, take up R&D activity related to water quality management and promote recycling and reuse of treated wastewater. However, Audit findings pointed out that till date, WQAA had issued only Uniform Monitoring Protocol (UMP) in 2005 for uniform procedure for sampling, analysis, data storage and reporting amongst the agencies operating Water Quality Monitoring networks in the country. A Task Force for development of Water Quality Data Information System; co-ordination in collection, use and dissemination of data; review of Water Quality Monitoring network for optimising network for the Country and for accreditation of water quality laboratories in the Country had been set up. It had not, however, taken any action towards promoting recycling/re-use of sewage/trade effluents, drawing up action plans for quality improvements in water bodies, schemes for restriction of water abstraction, reviewing the status of national water resources, identifying hotspots, etc.

6.2 Water Quality Review Committees were constituted in some States with an objective to improve coordination amongst the Central and State agencies to review/assess schemes launched/to be launched, to improve quality of water resources, review water quality data analysis and interpretation in order to identify problem areas, develop action plans for improving quality on a sustainable basis, identify hot spots for surveillance monitoring. However, audit findings pointed out that such Committees were active and met regularly only in two States viz.

Maharashtra and Himachal Pradesh. Audit also pointed out that since 2001, only seven meetings of Water Quality Assessment Authority had taken place.

6.3 On being asked to respond to these observations made by Audit, the MoEF submitted that :

"Under the National Water Quality Monitoring Programme carried out by Central Pollution Control Board/State Pollution Control Boards, water quality monitoring is being presently carried out at 1700 locations in the main stream of rivers, tributaries, lakes, tanks, ponds, groundwater, creeks, canals etc. In addition Groundwater quality monitoring is being carried out at 15,000 stations mostly in rural areas by Central Ground Water Board. The water bodies not meeting the desired water quality criteria are identified as polluted river stretches/water bodies. 10 river stretches not meeting the desired criteria were identified during 1988-89. The polluted stretches increased to 37 during the year 1992 covering all the major river basins. With the rapid growth in urbanization, industrialization, increase in population, subsequent expansion of monitoring network and coverage of more number of rivers for regular monitoring, the number of polluted water bodies identified in 2010 increased to 150. The polluted river stretches were intensively surveyed by Central Pollution Control Boards (CPCB) and State Pollution Control Boards (SPCBs) to identify the sources of pollution such as Urban Centres and Industrial Units. The deviation of water quality from the desired water quality criteria in the data generated by CPCB for the river Ganga formed the basis for launching Ganga Action Plan (GAP) and gradually extended to other polluted rivers through National River Conservation Plan (NRCP)."

6.4 As regards Water Quality Management Plan, it was further submitted that:

"WQAA is pursuing with State Governments to prepare water quality management plan for each and every state. Necessary guidelines were circulated to all State Governments for preparation of water quality management plan. Apart from this, the following information systems and websites have been launched to disseminate the data collected through various organizations of Ministry of Water Resources."

6.5 On the aspect of National Lake Conservation Plan (NLCP), the following submission was made:

"The Ministry is implementing the scheme of National Lake Conservation Plan (NLCP) since June, 2001 for conservation and management of polluted and degraded lakes in urban and semi-urban areas of the Country where degradation

is primarily on account of discharge of waste water into the lake, through an integrated ecosystem approach. The components/activities covered under NLCP are aimed at achieving treatment/rejuvenation of polluted/degraded lakes. In order to identify polluted and degraded lakes across the country, a study was carried out at the instance of Planning Commission. A list of 62 lakes across the Country requiring conservation was prepared under the study. The State Governments were asked to review this list and to prioritize the lakes in their States for submission of proposals under NLCP. Proposals for lakes conservation are considered for sanction subject to their admissibility as per NLCP guidelines, pollution status, prioritization and availability of funds under the Plan. Some States namely Chhattisgarh, Himachal Pradesh, Bihar, Manipur, Assam etc, had furnished priority list but either not submitted any proposal for consideration under NLCP, or the same not found meeting NLCP guidelines. States namely Jammu and Kashmir, Kerala, Uttarakhand, West Bengal, Tripura and Nagaland have sent the only one proposal each, which were examined and approved by the competent authority for funding under NLCP."

6.6 On a pointed query regarding meetings of the Water Quality Assessment Authority, Chaired by Secretary, Ministry of Environment and Forests, it was submitted that the last (9th) meeting of the WQAA was held on 30th May, 2012. It was further submitted that the Authority is required to meet twice in a year and furnish report of its activities to the Ministry of Environment and Forests once in three months.

6.7 On the powers of the WQAA, the Secretary, MOEF testified :

"Water Quality Assessment Authority is actually not really an authority in the sense that it has not been empowered to issue directions. If any direction is issued, it is issued under the Environment Protection Act which even we can do or which even CPCB can do or a State Board or a District Collector can do. This authority is nothing but a mix of three or four Departments, namely, Central Ground Water Board, Water Resources Ministry, Ministry of Environment and Forests and CPCB. They meet and discuss future plans especially of problems areas like Ganga. This time we met. After I came here, we met once. It is at least to exchange notes but it has not met for a long time. This is the first time we met in last one year. But the only thing is it is convened by the Ministry of Water Resources. They are the convenors. We are just a member of that. So, we are not the convenors of that."

6.8 Asked to explain the contradiction between the meetings required to be held annually and the actual meetings held, the Secretary, MoEF submitted during oral evidence as under :

"This is what it is supposed to do but it has not done so. But this year onwards we have started and I am quite sure we will be able to push through because actually unless we have a particular team or a subject to work on, it becomes very, very general discussion on water and problems of quality and quantity. So, we have taken up Ganga specifically."

6.9 On the deliberations made during the last meeting of WQAA, another representative of the Ministry submitted during oral evidence :

"Recently, in May 2012, we had this meeting of Water Quality Assessment Authority under the chairmanship of Secretary. There are members from the Ministry as well as experts from Indian Council for Water Resources and various other Departments. Yes, the meetings have been held at longer intervals……. This is an authority which is mandated to undertake the uniform monitoring protocol for the river water quality. It is the prerequisite to do the comparisons at various levels. The monitoring protocol has been finalized. That will be uniformly applicable to various river stretches. We will be undertaking some research proposals, which are impacting the water quality. So, that is one of the major agenda items, which this authority would undertake. We will see whether we need to have more experts on this protocol assessment authority to make it more technical and scientific insofar as the research work of this is concerned. So, we are working on a paper on this and we will be having this discussed in this Water Quality Authority meeting to be chaired soon by the Secretary."

6.10 As regards strengthening of Water Quality Monitoring Network, the Ministry submitted that the number of monitoring stations increased from 1019 to 2500 during 11th Plan. Network will be expanded to 5000 during 12th Plan, if funds are allocated. Monitoring of micro-pollutants will be strengthened with quality assurance. The Planning Commission has fixed the targets for strengthening of monitoring networks and to achieve the numbers by the end of 11th plan as 2500, by the end of 12th plan as 5000 and an optimum network for the size of the Country as 10000 monitoring locations. The strengthening programmes were initiated to fulfil the targets and accordingly financial requirements were proposed. The strengthening programme to achieve the targets will not be achieved if required funds are not allocated.

6.11 The Ministry further supplemented that the Government had notified rules for conservation and management of wetlands that restrict harmful activities such as construction, dumping of untreated waste, and industrialization, to prevent damage

to these sensitive ecosystems with high biodiversity values. The Wetlands (Conservation and Management) Rules, 2010, were aimed at ensuring better conservation and preventing degradation of wetlands. Under the rules, wetlands have been classified for better management and easier identification. Wetland regulatory authorities and appraisal Committees were set up at the Central, State and District levels to ensure proper implementation of the rules.

6.12 The Committee was informed that the Water Quality Assessment Authority (WQAA) was basically constituted with a mandate to make the water quality monitoring as a uniform practice. The Committee thereupon sought to know whether the WQAA had been able to live up to its mandate as an authority for water quality monitoring, the MoEF replied that Water Quality Assessment Authority (WQAA), since its inception has carried out a number of activities on water quality monitoring. Expert Group and Task Force were constituted to recommend the uniform procedure for sampling, analysis, data storage and reporting amongst the different governmental agencies operating water quality monitoring networks. Based on the recommendations of Expert Group and Task Force, a Uniform Protocol on Water Quality Monitoring (UPWQM) was prepared under aegis of WQAA and was notified through a Gazette Notification on Uniform Protocol on Water Quality Monitoring in June 2005. It was circulated to all the States and concerned Central agencies for implementation. WQAA provided a common platform for these organizations to come together, discuss, decide and share the data and experience on the water quality issues in the country. State Governments were directed by WQAA to constitute Water Quality Review Committees (WQRC) to attend to various related issues with the water quality at the State level. In pursuance of the decisions of the 6th meeting of WQAA, the WQRCs were reconstituted to make them more effective. Till date, 17 States have re-constituted Water Quality Review Committees in their States.

6.13 With respect to the constraints being faced in the functioning of the WQAA, The MoEF replied that Water being a State subject, Water Quality Assessment Authority

(WQAA) is unable to issue effective directives. Further, the Water Quality Review Committees re-constituted in 17 States at the State level were not able to function and implement the Terms of Conditions (TOR's) assigned to them.

6.14 On a pointed query on the apparent incongruity as to how a quarterly Report was to be furnished when the Authority is stipulated to meet only twice a year, the MoEF submitted that the provision of submitting quarterly reports to MoEF were replaced by annual reports *vide* the notification dated 27th May 2005. Moreover, Secretary, Ministry of Environment & Forests was the Chairman of Water Quality Assessment Authority (WQAA), the activities of WQAA were discussed in the meetings of WQAA as an Agenda item and as such Secretary, MoEF was well aware of the activities of WQAA. Secretary, MoEF issues directives from time to time regarding actions to be taken in the meetings itself.

6.15 Asked whether the present stipulation of frequency of meeting of WQAA was adequate for the discharge of its mandated functions, the MoEF replied in the affirmative.

6.16 On being asked about the legal status of WQAA as an Authority to discuss and coordinate important water pollution related projects, the MoEF replied that Water Quality Assessment Authority (WQAA) had been constituted by the Central Government in exercise of the powers conferred by sub-section (1) and (3) of section 3 of the Environment (Protection) Act, 1986. As per the Gazette Notification Order issued by MoEF *vide* S.O. 583 (E) dated 29th May, 2001 published in the Gazette of India (Extraordinary) dated 22nd June, 2001, the Authority shall exercise the powers under section 5 of the Environment (Protection) Act, 1986 for issuing directions and for taking measures with respect to matters referred to in clause (ix), (xi), (xii) and (xiii) of sub-section 2 of section 3 of the Act

6.17 Asked whether there was any proposal to enhance the powers of this Authority to elevate it to that of a regulatory Authority which can control and direct the

multifarious Central and State Ministries and Agencies involved with the issue of control of Water Pollution, the MoEF submitted that in pursuance of the decision taken in the 9th meeting of Water Quality Assessment Authority, a sub-committee had been constituted under the Chairmanship of Advisor, National River Conservation Authority, Ministry of Environment and Forests to look into the genesis, re-evaluation of its powers, its mandate, and achievements and suggest appropriate changes/course of action to make the Authority more effective and relevant.

6.18 About the role, functions and impact of the WQAA, the representative of the MoEF deposed as under :

> "Water Quality Assessment Authority will become more effective by institutional strengthening of water quality cell of Ministry of Water Resources which was providing secretariat services to WQAA and enhanced administrative control over State Water Quality Review Committees (WQRCs). WQAA was vigorously pursuing to bring State Governments on board for implementation of Terms of Reference (TOR's) of WQRCs. The specific remedial measures and steps inter alia consists of constitution of Expert Group and Task Force to recommend the uniform procedure for sampling, analysis, data storage and reporting amongst the different governmental agencies operating water quality monitoring networks, preparation of a Uniform Protocol on Water Quality Monitoring (UPWQM) under the aegis of WQAA and notification through a Gazette Notification on Uniform Protocol on Water Quality Monitoring in June 2005 and conduct of a National Workshop for preparation of guidelines on Water Quality Management Plan (WQMP) by CPCB. The Guidelines were circulated to all the States and UTs for implementation. Water Quality Review Committees were re-constituted in 17 States. One of the TOR's of Water Quality Review Committees (WQRCs) was under preparation of WQMP's for their respective States; Working Group on Minimum Flows in rivers constitution by WQAA which submitted its report during 2007. A Committee on Legal and Institutional aspects of the implementation of Working Group's recommendations on Minimum Flows was constituted which submitted its report during 2009. After detailed discussion on these two reports in 8th WQAA meeting, a Sub-committee was constituted to review the Group's recommendations of 2007. The sub-committee has submitted its report; preparation of a report on 'Water Quality Hot spots in rivers of India' by CWC. The 88 critically polluted Industrial Clusters identified by CPCB and the recommendations of CPCB were circulated to State Governments by WQAA. CGWB report on 'Water Quality in Shallow Aquifers' under the aegis of WQAA were circulated to all the States; etc.

6.19 On a pointed query as to whether WQAA will be able to take charge of Water Pollution issues nationwide, as a single agency and ensure that national standards

are developed, propagated and maintained, with better coordination across the States and lessons learnt being exchanged across the Nation, the MoEF submitted that Water Quality Assessment Authority (WQAA) has time to time issued directives to State Governments to reconstitute the Water Quality Review Committees (WQRC) to coordinate works assigned to them as per the TOR's. WQRCs in 17 States had been re-constituted as on 01.03.2013. WQAA was vigorously pursuing to bring State Governments on board for implementation of TOR's of WQRCs.

6.20 The Committee were informed that WQAA was pursuing with State Governments to prepare Water Quality Management Plan for each and every state. Necessary guidelines were circulated to all State Governments for preparation of water quality management plan. On a pointed query as to what stage was this preparation of Water Quality Management Plan across the States, the MoEF replied that guidelines for the preparation of Water Quality Management Plan have been circulated to all the States. However, none of the States had prepared Water Quality Management Plan as of 01.03.2013.

6.21 On strengthening the water quality monitoring network, the Road Map of the MoEF brought out the fact that the CPCB has been monitoring water quality at 1429 stations within the available resources. These stations covers 293 rivers, 94 lakes, 9 tanks, 41 ponds, 15 creeks/ sea water. There are 64 parameters which are analysed in river/ lake/ ground water samples taken from rivers, lakes, ponds, creeks etc. These parameters were monitored on different intervals. The station specific parameter was selected on the basis of source in the vicinity of monitoring station. However, for inclusion of new parameter, toxicity study was carried out to single out new parameter and further study was carried out in the lab to study its toxicity before taking it up for regular monitoring. The water quality data was published and circulated. Towns and cities were included under NRCP for abatement of pollution of rivers on the basis of proposal received from the State Governments and approved under NRCP on the basis of funds available under the Plan from time to time. Currently, automatic water quality monitoring stations were being installed on

river Ganga and River Yamuna to further strengthen the manual monitoring carried out on river Ganga and Yamuna. The data so obtained are published regularly by CPCB. The data analysis for a particular monitoring station would indicate trends if parameters are varying with respect to time, no change in data provides baseline status of the ground water quality and station located near source of pollution indicates impact of activities on the ground water.

6.22 It was further pointed out that additionally, NRCD was also interacting with various organizations in the Country for setting up more water quality monitoring stations including of CPCB, SPCBs, and academic institutions to measure water quality of river stretches where it has taken up pollution abatement schemes. So far the major monitoring thrust has been in the Gangetic basin. With schemes being taken up on other rivers, the monitoring programme of the Directorate has been extended to other rivers. The objective of the monitoring programme was to establish the water quality in the rivers before the schemes are taken up and then compare it with the quality as the implementation of scheme progresses in order to check the efficacy of the actions taken. The locations are usually closely spaced downstream of cities and wastewater outfalls. The locations may be classified as surveillance type for pollution monitoring. The water was analyzed mainly for pollution related parameters, BOD, DO and coliforms. At some places analysis for heavy metals was also included.

6.23 Objectives of Water Quality Monitoring listed in the Road Map *inter-alia* included :

- To continuously monitor the water quality of the stretches of rivers, where NRCD programmes are being implemented to assess the effectiveness of pollution control efforts and draw water quality trend over a period of time.
- To evaluate proper functioning of pollution control systems installed under the River Action Plan.
- To assess the improvement in water quality as a result of the implementation of the River Action Plan.

- To assess pollution loads in terms of important pollutants, entering in to the river by continuous monitoring of major drains on regular basis.
- To assess micro pollutants load in the river water and sediment through their seasonal monitoring.
- To assess water quality of the river comprehensively in terms of important water quality parameters (42 parameters) once a year.

6.24 On strengthening the Water Quality Monitoring Network, the Road Map of MoEF further states that the scope and coverage of water quality monitoring needs to be enhanced in terms of a number of monitoring stations, its automation and parameters and in pursuance to this, made the following recommendation pertaining to Water Quality Monitoring Programmes :

- A report on the status of pollution of all major/minor Rivers and their tributaries and lakes/wetlands may be compiled by CPCB. This may be updated every 2 years. This will form the basis for initiating action for the abatement of pollution of water bodies, in the country.
- MoUD has formulated a set of Standardized Service Level Benchmarks (SLBMs) for Urban Water Supply and Sanitation (UWSS) as per International Best Practices. The SLBMs have been circulated to the States in September 2008 for adoption in infrastructure development projects. As far as possible, projects seeking Central Assistance shall be appraised with respect to these benchmarks.
- Central Ground Water Authority may compile a report on the status of pollution of ground water sources in the country.
- The guidelines contained in the Uniform Protocol on WQM Order, 2005 should be followed in selecting the locations for drawing samples.
- For the water quality monitoring programmes to be effective, a minimum 10% of project funds need to be allocated for this activity.
- Biological indicators reflect the effect of pollution on the water bodies. However, cause of pollution is difficult to be established with biological indicators. For better source identification, specialized parameters like

heavy metals, pesticides, etc. may also be included in the monitoring program wherever required.

CHAPTER VII

NEED FOR A NATIONAL LEVEL LEAD COORDINATING AGENCY

7.1. Audit findings pointed out that while the outputs of the actions of CPCB and SPCBs were co-related, there was no functional co-relation between them at the input stage. This dichotomy of control causes a situation whereby there was no single agency to take charge of the issue of control of water pollution on a nation-wide basis.

7.2. The Committee were informed that considering the inter-state and inter Ministerial nature of the issue of water pollution, a proposal has been made to the Planning Commission for constitution of a body within the Commission itself as a lead coordinating agency for enforcement of the Road Map drawn up for implementation of the recommendations made in the Audit Report. On being asked as to what was the current status of constitution of this lead coordinating agency, the MoEF stated that the matter of co-ordinating agency was just at conceptual stage and it needed to be discussed with various stake holders to arrive at consensus before a concrete proposal was formulated.

7.3. The Committee sought to know whether this proposed lead coordinating agency be able to address the issue of functional non-co-relation amongst the CPCB and SPCBs and dichotomy of control as pointed out by Audit. The MoEF, thereupon, submitted that the issues related to Water Pollution in the Country are discussed at central level with the State Pollution Control Boards and Pollution Control Committees in a Conference of Chairmen and Member Secretaries of Central and the State Pollution Control Boards. A common strategy was evolved and worked on it jointly by all stake holders. The conference of Chairmen and Member Secretaries of the Central and the State Pollution Control Boards met at regular intervals at Delhi or at any State venue and discuss problems facing the nation regarding water pollution, policy and rules and Regulations, etc. The inputs and outputs were thus related to action planned.

7.4. On the observation of the Committee that sometimes there is a map but there is no road, the Secretary, MoEF deposed during evidence as under:

"The point is it is possible if once or twice they have the meeting at the central level and then break it up into six or seven States where the same group will be represented at the State level and they will review. There are only two things which the State Governments will have to agree to. That is another reason why it is not working. One is, the problem between sanitation and industrial pollution. That means institutions are working in silos. They are not cooperating because of these two laws. The second problem is that who will pay."

7.5. Elaborating on the need for generation of revenue for meeting treatment of sewerage cost for control of water pollution, he supplemented as under :

"Now PPP model has been used very well for the roads and infrastructure sector where the revenue is absolutely guaranteed because you can actually film it and you can actually know exactly what is the minimum number of vehicles passing by. That is the only reason it is working. In the case of water pollution, it is a cost which is added to the meter for water supply. Nobody really wants to add that and sewerage cost. They say that you do not treat properly, we will not pay. So, this is the reason why private sector is not coming forward to take this. Operation costs of sewage treatment plants cannot ever be met only by sewerage charges because in such a case the sewerages charges will go up very high. This is the reason why some level of subsidy will be required if you want the private sector enterprise to come and raise resources to 100 per cent cover the network."

7.6. Citing the new holistic and basic approach of the current Ganga Project, he further deposed that :

"In the Ganga case, you mentioned about earlier Ganga project not having worked simply because we paid for only treatment. We did not pay for collection. Today's Ganga project will work because we have taken a holistic and basin approach where each house-to-house connection we are paying for on a 70:30 basis. They are paying 30 per cent and we are paying 70 per cent plus we are giving operation and maintenance 100 per cent coverage for five years." Of course, since we are doing that there is no incentive for the State Governments to slowly start charging. It is because unless they start charging and put a little subsidy no private person is coming forward to maintain these resources. But one thing is that it has come to the knowledge of the State Governments that it is a very important thing and now we have to talk very seriously."

7.7. Emphasising on the imperative need for a lead co-ordinating body, he further testified as under :

"The main point I want to underline here is that there is need for a coordinating body to start pulling in these measures and using this book (Road Map) as the first agenda. After that, this can be prioritised and made into smaller modules."

7.8. On a pointed query of the Committee as to why they have failed on the aspect of co-ordination, the Secretary of MoEF deposed during evidence that :

"It is because we have reached a stage where we may not be able to quickly do this coordination. What you are saying is correct. In the case of power, telecom, coal etc., we have perhaps not reached a stage where we need to urgently look at something and coordinate at this level. There is not much of coordination involved there. There, it is a question of price fixing or deciding policy on how to distribute or allocate natural resources. This case is very different. In this case, we only have knowledge. We just do not know who will do what and how to coordinate on a daily basis. Our monitoring is also completely in silos. We do monitoring only for industrial pollution at 1,700 places in the country. CGWB is monitoring 15,000 wells in the Country and giving data. That is the only work we are doing. We need someone to coordinate this whole thing and start taking action."

CHAPTER – VIII

SEWAGE TREATMENT

8.1 Audit scrutiny revealed that the Country's 14 major, 55 minor and several small rivers receive millions of litres of sewage, industrial and agricultural wastes. The most polluting source for rivers is the city sewage and industrial waste discharge. Presently, only about 10 percent of the waste water generated is treated; the rest is discharged as it is into the water bodies. In this context, the Committee have been informed that Water, being a State subject, major responsibility for sewerage facilities rests with the State Governments and the MoEF was only supplementing their efforts. It has further been submitted that sewage generation by 2025 was estimated to be about 4100 mld. Considering the available capacity and the capacity of about 700 mld being constructed, including under JNNURM, the gap was expected to be around 2200 mld by 2025.

8.2 In the above context, the MoEF was asked as to how they plan to augment the efforts of the State Governments/Urban local bodies who has the primary responsibility of creation of civic infrastructure facilities for treatment of wastewater including safe disposal. The Ministry thereupon submitted in their written reply that the constitutional amendment has empowered them to raise funds for creation of infrastructural facilities. The need of the time was for State Government to prepare a long term plan for creation of sewerage infrastructural facilities. The State Government may have to evolve a revolutionary design now for taking care of providing adequate civic infrastructure facilities for not only treatment of wastewater including its safe disposal but also collection and proper disposal of solid waste, unclaimed bodies, animal carcasses, religious offerings, etc which are dumped at times in river causing severe pollution and unhygienic conditions. The private sector investment was inevitable who may participate if conducive environment coupled with incentives were put in place to attract them. Under World Bank funded Mission for Clean Ganga, efforts are being made to enlist proposals for funding under PPP model also. On the above lines, State Govt are to be advised to proceed at the earliest.

8.3 On being enquired as to whether the Planning Commission has so far come out with any time bound strategy to bridge the gap between required sewage treatment capacity and available treatment capacity in the country, the MoEF stated that the issue of inadequacy of civic infrastructural facilities can only be tackled over a period of time in a phased manner. It requires proper planning, allocation of adequate resources and capacity of institutions to introduce new and efficient infrastructure in time. The Planning Commission has been making adequate allocation of funds for supplementing the efforts of the State Governments for creating civic infrastructural facilities in the States.

8.4 Ke

eping in view the huge requirement of funds as estimated by the High Powered Expert Committee (HPEC) on Urban Infrastructure and Services, the Committee

sought to know how the funds requirement were going to be met. The MoEF thereupon submitted that the funds requirement may be met by creating an exclusive financial institution like National Bank for Agriculture and Rural Development (NABARD) for creating civic infrastructure in towns and cities in which Central Government, State Government, ULBs and public have equity participation. External assistance from bilateral and multilateral agencies through a mix of equity and debt may also be included. Funds may also be mobilised from private sector, banks, financial institutions etc. The Central Government and State Governments may contribute funds for creating infrastructure and it may be allocated to the projects by Central Government on the recommendations of the expert organization like Central Pollution Control Board/ State Pollution Control Board. These projects may be executed by creating separate organization like National Highways Authority of India, DMRC, U.P. Bridge Corporation, etc or else private participation may be invited.

8.5 On a pointed query as to whether any action plan has been formulated to enhance the capacities of municipalities for recovery of user charges for water and sewerage systems, the MoEF stated that the mechanism to collect user charges for sewerage and water facility has already been put in place in States. However, collection of data may only indicate actual realization and shortfall with respect to target for further improving the collection and enhancing the capacities of municipalities for recovery. It was further submitted that the Ministry of Urban Development may have to look in to it.

8.6 Asked whether India has any comprehensive policy for sanitation, the Ministry submitted that it has published the National Urban Sanitation Policy (NUSP) in 2008. However, sanitation being a State subject, the NUSP is a model policy for the States to prepare their own sanitation strategies.

8.7 On being asked as to whether efforts taken in this direction under various Central Schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM), Urban

Infrastructure Development Scheme in Small and Medium Towns (UIDSSM) and States Schemes were being dovetailed to the River Conservation Programme to address the issue of the huge gap in sewage treatment capacity in a holistic manner, the Ministry stated that it examines in details, proposals for sewerage and sewage treatment projects duly considering other Ministries projects, under NRCP etc. For example, in Hyderabad, the sewage treatment plants were approved under National River Conservation Plan (NRCP) whereas sewerage network was approved under JNNURM – UIG.

8.8 On the issue of sewage treatment, the Committee was informed of two main problem areas. First was the apparent lack of coordination with institutions working in isolation and the second was the difficulty in recovery of cost of investment in this sector. It was submitted that some level of subsidy will be required to motivate private sector enterprises to invest in the creation of sewage infrastructure as revenue generation cannot be guaranteed unlike in other sectors like roads where the Public Private Partnership (PPP) model was working successfully.

8.9 In this context, the Committee sought to know whether this problem of lack of Coordination would be addressed by the envisaged lead coordinating agency being proposed within the Planning Commission, the Ministry stated that the lead coordinating agency being proposed within the Planning Commission will monitor whether decision making was made expeditiously.

8.10 On being asked as to whether any serious proposal has been made for introduction of some level of subsidy for motivating the private sector enterprises to set up PPP models for creation of sewage infrastructure, the MoEF stated that under World Bank funded Mission for Clean Ganga, efforts were being made to enlist proposals under PPP model for developing sewerage infrastructure. The State Governments of participating States have also been exploring the possibility to execute projects on “Public Private Partnership (PPP)" model.

8.11 On the issue of low levels of treatment of sewage generated, the Committee have been informed that the low levels of treatment of sewage are primarily due to inadequate arrangement for collection of sewage. To enhance collection of sewage, Ministry has been considering funding of sewerage schemes with sewage collection right from the houses rather than interception and diversion. This will ensure 100% collection of sewage and treatment. The new guidelines prepared by the Ministry in 2010 for the preparation of DPR has also envisaged preparation of City Sanitation Plan which will address the problem of low level treatment of sewage.

8.12 In this context, the Committee sought to know whether the Ministry proposes to outsource such sewage collection works through Public Private Partnership models, which may ensure more effective collection and treatment, the MoEF reiterated their earlier reply that under World Bank funded Mission for Clean Ganga, efforts are being made to enlist proposals under “Public Private Partnership (PPP) model for developing sewerage infrastructure which would include sewage collection and treatment, both."

8.13 On being asked as to whether there was any concept of collecting fees/charges for collection and disposal of sewages from the generated sources, the MoEF stated that the mechanism to collect user charges for sewerage facility had already been put in place in States and State Government/ULB etc. were collecting sewerage charges. Further, on the modalities involved, the MoEF stated that the user charges are collected by ULBs/municipal authorities/Sewerage Boards along with water bill or property tax, etc.

8.14 The recent report of the WHO points to 638 million Indians not having access to toilets, as compared to 58 million (the second highest) in Indonesia and 50 million in China. India seems to be the leader where it should not be. The Report of the CAG in para 4.2 confirms the situation that even large cities like Bangalore which is the IT hub of India is able to treat only 10% of the sewage being generated. In Hyderabad, the percentage of treatment is at 43% and in the national capital Delhi, it is at 62%. The Committee sought to know as to what serious thought has been given to deal

with the situation that puts India in such a poor light. The MoEF thereupon merely replied that the sewage generated in Bangalore is collected and more than 50 % is treated in sewage treatment plants having total treatment capacity of about 721 mld. In Hyderabad city sewage generated is collected and 100% is treated and treatment capacity of 592 mld has been provided. Additional treatment capacity is being created to treat sewage generated from neighboring municipalities also. In Delhi, 3800 mld sewage is generated and 63 % of the installed capacity of 2460 mld is treated. On a pointed query as to whether MoEF/ CPCB were regularly monitoring STPs built under NRCP and how does the MoEF satisfy itself that effluents from STPs meet the criteria laid down by CPCB, it was stated that CPCB inspected 152 STPs during 2011-12 and findings were made with respect to General Standards for Discharge of Environmental Pollutants into inland surface, public Sewers, land for irrigation, marine coastal areas under Schedule-VI of the Environment (Protection) Rules, 1986 viz. 49 numbers of STPs are exceeding Bio Chemical Oxygen demand (BOD) standards, out of which 12 Sewage Treatment Plants are in Uttar Pradesh, 14 STPs in Haryana, 06 in Punjab, 04 STPs of Madhya Pradesh and 03 (each) in Tamil Nadu and West Bengal; With respect to Chemical Oxygen Demand (COD), 07 STPs are violating the General standards of discharge, out of which 06 are in Haryana; and 30 STPs are non-operational and 09 STPs are under construction.

8.15 Under JNNURM, MoUD was also sanctioning schemes for the treatment of sewage water in cities. On a pointed query as to how MoEF intend to dovetail its programme under NRCD with JNNURM to ensure that there was no duplication, the MoEF stated that the Ministry, under new guidelines for Detailed Project Report preparation has mentioned that schemes sanctioned under JNNURM or any other central programme should be properly dovetailed. This Ministry of Urban Development also examines in detail, proposals for sewerage and sewage treatment projects duly considering other Ministries projects, under NRCP etc. For example, in Hyderabad, the sewage treatment plants were approved under National River Conservation Plan whereas sewerage network was approved under JNURM – UIG.

8.16 On being asked to state whether MoUD compiles data on coverage and adequacy of sanitation facilities (including proper disposal of sewage) state wise and district wise, it was stated that the State wise data on availability and type of latrine within the premises has been collected and compiled by the office of the Registrar General and Census Commissioner, Govt. of India and furnished in Census of India, 2011.

8.17 On the steps being taken by MoUD to address the issue of Water Pollution under its various schemes (Jawaharlal Nehru National Urban Renewal Mission and Urban Infrastructure Development Scheme for Small and Medium Towns, etc.) the Ministry submitted that in order to improve the situation in water supply and sanitation, Govt of India launched JNNURM in 2005 with a view to provide financial assistance to the State Govts for creating urban infrastructure facilities including sewerage and municipal solid waste management for all the cities in the Country with a reform oriented agenda. JNNRUM had two components namely, Urban Infrastructure and Governance (UIG) and Urban Infrastructure Development Scheme for Small and Medium Towns(UIDSSM). Under UIG component, 67 mission cities having population more than 1 million and State Capital were eligible and remaining towns were eligible for funding under UIDSSMT.

8.18 It was further submitted that the Ministry of Urban Development also administers the following programmes :

- Pilot scheme for Urban Infrastructure and Satellite towns around seven mega cities (UIDSST), the objectives of which were to develop urban infrastructure facilities such as water supply, sewerage, drainage and solid waste management etc. at satellite towns/ counter magnets around seven mega cities.
- 10 % lump sum scheme for Benefit of North Eastern Region including Sikkim under which projects were sanctioned for improvement of urban infrastructure services.
- ADB assisted North Eastern Region Urban Development Programme (NERUDP), under which financial assistance was provided for improvement of urban infrastructures and basic services in five capital cities of North Eastern States.

- Under Accelerated Urban Water Supply Programme (AUWSP) now subsumed under UIDSSMT, a total of 1244 water supply schemes had been sanctioned at an estimated cost of ₹ 182287.64 lakh for the towns having population less than 20,000 as per 1991/2001 census.
- Central Sector Scheme of Solid Waste Management and Drainage Scheme for 10 selected IAF airfield towns under which solid waste management and drainage facilities were provided in 10 selected towns viz., Ambala, Sirsa, Adampur, Jodhpur, Dindigul, Gwalior, Pune, Hindon, Bareilly and Tejpur having airfields of Indian Air force.

8.19 On being further asked as to how many projects have been funded by MoUD to address the issue of Water Pollution under its various schemes during 2007-12, the MoEF submitted that under UIG Sub-Mission of JNNURM, 157 projects on water supply have so far been approved for various mission cities with approved cost of ₹ 2048589.03 lakh and ACA commitment of ₹ 1008819.48 lakh. Out of this, an amount of ₹ 683113.60 lakh has been released for utilization so far. 45 projects have been reported physically completed and the remaining projects are at various stages of implementation. Projects which address the issue of water pollution are presently under execution by the project States under the NERUDP were given as below:

Table 8.19 : Projects under the NERUDP funded by MoUD

S. No.	City/ State	Sector	Allocation(Rs Crore) under Tranche–I (2009-14)	Funds released till March 2012 (Rs Crore)	Present Status
1.	Kohima (Nagaland)	Solid Waste	16.85	1.85	In progress
2.	Shillong (Meghalaya)	Solid Waste	2.05	NIL	In progress

8.20 On a specific query as to whether MoUD consulted MoEF / CPCB before sanctioning such projects for control of Water Pollution, the Ministry submitted that the Government of India has constituted Central Sanctioning and Monitoring Committee (CSMC) under the Chairmanship of Secretary (UD) with members from various Ministries including Ministry of Environment and Forests for approval and Sanctioning of the projects under JNNRUM. MoEF was consulted for the overall

NERUDP Scheme and the MoEF was represented in the National Steering Committee. In each project sanctioned under the Scheme, consultation with the appropriate Pollution Control Authority was done as required.

8.21 On a pointed query as to how MoUD was monitoring the implementation of projects funded by it, the Ministry submitted that as per the JNNRUM, State Govt/ ULBs were responsible for implementation of the projects. Ministry also monitors implementation of approved projects through various mechanisms such as Quarterly Progress Report (QPR), field visit etc. Independent Review and Monitoring Agency (IRMA), Project Implementation Unit (PIU) at ULB level and Project Monitoring Unit (PMU) have been appointed by the State Governments to ensure the quality and timely execution of the projects. The Central Government provide funds for PIU, PMU and IRMA through JNNURM. For projects sanctioned under NERUDP, an Investment Programme Coordinator Cell (IPCC) has been created in the MoUD with suitable staff for overall management and monitoring of projects in five programme States. The IPCC is supported by Programme Management and Monitoring Consultants (PMMC) - a team of experts in various related fields - to assist in project management and monitoring. A National Steering Committee (NSC) has been formed to monitor progress of execution and provide guidance for effective implementation which meets quarterly. Under the project a dedicated State Investment Programme Management and Implementation Unit (SIPMIU) comprising of experienced officers and experts has been created in the urban development department of each State. They were supported by a team of Consultants for efficient execution of the project. On a query as to whether there has been any improvement in the status of water quality of Water Bodies in the towns, where MoUD had sanctioned its projects, it was submitted that the quality of water in water bodies in and around towns was being monitored by the Central Pollution Control Board (CPCB).

8.22 On being asked as to whether MoUD consider water-harvesting essential in view of water shortage/ water pollution and what were the plans to improve water harvesting in the Country, it was stated that the Ministry of Urban Development has forwarded the guidelines for Roof Top Rain Water harvesting to all the State Governments including Central Public Works Department with a request to adopt Roof Top Rain Water harvesting in all Government buildings. In September, 2000, the Ministry of Urban Development had issued a gazette notification dated 28th July 2001 whereby modification/ addition to the buildings byelaws of 1983 had been made in National Capital Territory of Delhi. According to the Notification, it has become mandatory to adopt water harvesting through storing of water runoff including rainwater in all new buildings on plot of 100 square metre area in and around Delhi. Further, roof top rain water harvesting for recharge of ground water was one of the reforms under the JNNRUM. The 67 mission cities and other cities seeking funds under the programme are required to implement the reform for rooftop water harvesting in their jurisdiction.

8.23 The Road Map brought out by the MoEF to manage water pollution in India identified the substantial gap between wastewater generation and treatment capacity. A time bound action plan needs to be evolved to bridge the gap and to ensure that state of art sewage treatment facilities are established to tackle 100% sewage treatment. This needs to be reflected in the priorities of State Government/ULBs. Planning Commission should therefore be requested to undertake an exercise in consultation with the Ministry of Finance to evolve a time bound action plan with the involvement of States, ULBs, Ministry of Urban Development, MoEF etc so that the requisite treatment infrastructure can be built. The issue of ensuring optimum utilization of these assets and the reforms required for their sustenance should also be addressed under this exercise. Delays in award and implementation of projects needs to be cut down through improvement in project implementation by dedicated entities, streamlining the procedure and empowering the organisations. With respect to industrial effluents, it is the responsibility of the industries to comply with the prescribed standards for the

discharge of the effluent. This needs to be strictly enforced by the State Pollution Control Board (SPCBs). For industrial pollution control, stricter enforcement of environmental norms is required. In this regard CPCB and SPCBs need to be adequately strengthened.

8.24 The Road Map stated that action was therefore required on two fronts viz. Capacity building of SPCBs and CPCB – under world bank assistance a programme in this regard is being prepared by the CP division of the Ministry which may be fast tracked; Institutional reforms in SPCBs – Institutional reforms in the SPCB are required through necessary amendments in the Water (Prevention and Control of Pollution) Rules, 1975 so that the powers delegated to SPCBs under the environmental laws are effectively used; well qualified personnel are appointed as member secretaries and chairpersons and stability of tenures of member secretaries and chairperons to be ensured. It further stated environmental violations need to be suitably penalized and the penalties should be large enough to have a deterrent impact. Necessary amendments to the EP Act should, therefore, be carried out in a time bound manner. Unsystematic use of water has a bearing on the availability of water. River should have enough dilution potential in order to take care of the effluents discharged after treatment and to sustain its self cleansing process. A policy, therefore, needs to be framed by MoWR for rational use of water in the Country by the State Governments and ULBs. Rational charges for use of water in agriculture, industrial and domestic purpose need to be worked out and implemented by appointment of empowered, independent regulators. The project of 'Web Enabled Water Resources Information System' launched by CWC for, Water Resource assessment and monitoring, should be expedited. Apart from pollution of rivers from industrial and municipal sewage there is a significant contribution from the runoff from the agricultural fields. This can be checked by comprehensive measures related to use of fertilizers and pesticides. A clear cut policy therefore needs to be evolved by Ministry of Agriculture in this regard.

8.25 The Road Map further made the following recommendations on Municipal Sewage System.

- The primary responsibility for creation of civic infrastructure facilities for treatment of wastewater including its safe disposal lies with the State Governments/ Urban Local Bodies (ULBs). Central Government is supplementing the efforts of the State Governments/ ULBs for creation of these facilities through central schemes. A time bound action plan, therefore, needs to be prepared under the aegis of the Planning Commission to bridge the gap between required sewage treatment capacity and available treatment capacity in the Country.

- A total urban sanitation programme needs to be launched by Government of India to achieve 100% sanitation in the urban areas of the country.

- Keeping in view the huge requirement of funds as estimated by the High Powered Expert Committee (HPEC) on Urban Infrastructure and Services constituted by the Ministry of Urban Development, the amount to be allocated by Government of India under JNNURM needs to be stepped up for creation of sewerage and sewage treatment infrastructure.

- The river water quality is monitored to maintain best designated use of rivers in the Country. Any deterioration in water quality leads to change in designated best use of river stretch warranting immediate attention and action.

- The water bodies not meeting the desired water quality criteria are identified as polluted river stretches/water bodies. CPCB has studied potential pollution sources and relevant sub-basin-wise characteristics. They have been undertaken with the objective of formulating action plan to restore and maintain the river water quality at such level as is needed to sustain the designated-best-use of the different stretches of the river. Comprehensive action plan for the abatement of pollution of these stretches should be prepared synchronizing with the ongoing programmes. Projects may be prepared by the State Government for the abatement of pollution in the stretch.

- Attempt may be made to develop and implement public-private partnership models for setting up and operating effluent and sewage treatment plants. Once the models are validated, progressively use public resources, including external assistance, to catalyze such partnerships.

- Enhance the capacities of municipalities for recovery of user charges for water and sewerage systems.

- Prepare and implement action plans for major cities for addressing water pollution, comprising regulatory systems relying on appropriate combination of fiats and incentive based instruments.

- Projects implemented through public agencies as well as public-private partnerships for treatment, reuse and recycling of wastewater from municipal and industrial sources may be encouraged.

- Promote R&D in development of low cost technologies for sewage treatment at different scales to yield multiple benefits.

- For holistic approach apart from trunk sewers, branch & lateral sewers and house connections up to the property line should also be included in projects to make the city fully sewered.

- City Sanitation Plan (CSP)/Sewerage Master Plan shall be the basis for planning and formulating projects. Therefore, preparation of these plans, wherever it doesn't exist, will be the first step. However, CSP shall be prepared on the basis of City Development Plan (CDP), if so drawn and finalized for the city.

- SMP should include complete details of generation of sewage in the city, its collection, conveyance including pumping requirements, Road Map to achieve 100% treatment to desired levels and recycling aspects keeping in view the river water quality.

- It may be ensured that the new project are formulated and implemented with public consultation and there is Synergy with the MoUD programmes namely; Jawaharlal Nehru National Urban renewal Mission (JNNURM), Urban Infrastructural Development Scheme in Small & Medium Towns (UIDSSMT).

- It is necessary to formulate an effective public education, awareness and participation programme as part of DPR so as to make them socially inclusive. An expert agency with right kind of background and experience may be engaged to formulate Public Participation strategy.

Industrial Effluent

- Action may be initiated against the defaulter municipalities/industries by the SPCBs concerned. The Boards may also issue directions for closure & disconnection of electricity/water/ other services in case of persistent defiance by any polluting industry, under section 33-A of the Water Act and section 5 of the EP Act.

8.26 On the aspect of Sewage treatment, the Secretary, MoEF deposed:

"On the whole today the latest 2010 picture is that class I and class II town together, not industries, just the towns and cities are producing 38,250 million litres a day of domestic sewage which includes commercial as also agricultural run off. Now, the treatment capacity available in our Country today is 11,788. So it is about one-third treatment capacity is available and out of this treatment capacity about 30-40 per cent is not working optimally and that is because of mechanical failures and also management failures. Why I am mentioning this is because it is a management failure. Mechanical failure can be repaired but management failure is impossible to repair. That is where we again get into a problem whether it should be privately managed or it should be completely Government managed. It is because any confusion in between is becoming an issue. So, wherever we have seen that the sewage treatment plants are working and where methane is being recovered and electricity is being generated from the sewage. There are some places like Hyderabad where it is happening there where they are running the treatment plant with methane from the sewage. Similarly, this is happening in J&K also. They have started. So, from that Ganga Action Plan some cities along the Ganges where the sewage action plants are not working because industrial pollution cannot be treated by these plants. This has to be solved again through a rigorous coordination of a body which is dealing with financing and resource control for both Centre and States for which I have submitted to this hon. Committee that it should be the Planning Commission. We are willing to service the Planning Commission right up from the Centre to the State level."

8.27 On a pointed query on sewage management, the Secretary, MoEF submitted during oral evidence :

"A sewer line, by the way, going into the river is under a Central Act. It is made by the State at that time and States also have the power to make Acts on water. It is because the water is a State subject. We do not make laws on water and water management. We do not make laws on water at all. It is done by the Ministry of Water Resources at Centre. Even the sewerage is not with us. Sewerage management, sewerage treatment plants, everything is with the Urban Development Departments and in the States with the local authorities. That is

the reason that right from the beginning I have been saying that we must have a central coordinating body. I suggested for the Planning Commission for the simple reason that Planning Commission has got expertise. It is also in charge of resource allocation. States give it lot of importance. Whenever the Planning Commission's meetings are held, the highest level of representation happens there. So, keeping all this in view, I felt that Planning Commission is a better option."

8.28 On a query whether the Ministry was taking any conscious step to create a sense of urgency of the issue such as by way of initiating a Cabinet Note, etc. it was stated that the concept needed to be discussed with all stake holders before initiating a concrete proposal.

8.29 On the aspect of practical problems faced in recovering the cost of collection and treatment of sewage and solid waste from the public, which are major pollutants of water, the Secretary, MoEF deposed during evidence as follows:

"Sir, as I said, operationally we will not be able to meet the total cost because of the technologies being used for different types of treatment. Therefore, under this model what we have suggested in the NGRBA is that we go for river front development and we give them other revenue tools."

8.30 On the supply of pollution free potable water requiring a town free from the malaise of human excreta and other types of sewerage flowing into the rivers or treating them, the Secretary further testified during his oral evidence that :

"Sir, there are examples already in India where they are using a slab system which is consumption based system. Anybody who is using more than so many kilo litres a day immediately comes into the higher bracket. In such a case what is happening is that the poor people either who are encroachers or who are not metered, they are covered."

8.31 On a further pointed query as to whether metering of use of water has been done in Delhi, he replied in the negative and stated during oral evidence that to the extent of higher consumption, it will cross subsidise the poorer layers, which was still possible.

8.32 On the Committee's view that a strong will on the part of the political leadership in the Country was needed for enforcing the cost recovery from the citizens, the Secretary candidly submitted during his oral evidence that otherwise, it would be impossible to carry on as they do not have the resources.

8.33 He further supplemented as under :

> "There is a proposal, therefore, that now collection, to the extent that the rich people in the city pay to that extent, to collect and the rest of the money would have to be arranged for the private developer from outside, from other sources. It is one model and it is working in only few cities. It is not accepted everywhere and we are trying to upgrade it as part of NGRBA discussion."

8.34 On a specific query on pollution of river Tamil Nadu, the Secretary, MoEF testified as under during his oral evidence :

> "Firstly, in Tamil Nadu we have identified nine places. We are monitoring these nine places very regularly. In these rivers and within these rivers, we have got certain catchments; micro catchments which we are monitoring on a regular basis. For each area, there are various actions taken. We have an industrial problem. So, both the High Court of Chennai and we got together; industries are being closed one by one, and they are being opened depending upon their performance. It is 'zero' discharge. What we are trying to do with the industry is this. The Cauvery River and its tributaries including Noyal River in Tamil Nadu are not allowed to discharge any liquid. In other words, multiple effective evaporators on a common basis are being encouraged by our Ministry for the industrial clusters. These are working very well. So, for these 43 industrially polluted clusters which we have identified and in other less polluted clusters also, we have introduced this concept of evaporation where such waters which cannot be treated, which has got very high inorganic and salt content are evaporated, and the solids are passed on and kept in a lined landfill called TSDF, that is, Treatment Storage Disposal Facilities. So, this is a new development in the last four or five years."

8.35 On being asked as to whether the polluting contents are being examined for their poisonous and toxic effects, the Secretary, MoEF deposed during his oral evidence as under :

> "Yes, Sir. These come under our list of hazardous substances and hazardous wastes. Now, those industries and clusters which are using producing these wastes in a mixed form with sewage, such wastes are to be segregated at the industry level, and after segregation, instead of sending it to the STP or the common effluent treatment, which is not effective, it is dried up completely."

8.36 On further being asked as to whether these hazardous wastes were dumped or stored elsewhere after drying up, the Secretary in his testimony replied in the affirmative and stated that it was done for highly toxic or reactive wastes.

8.37 Elaborating on the sufficient precaution taken while dumping these hazardous wastes, the Secretary stated that :

> "Before we put it into the lined landfill, we do neutralization and we do sterilization, and then only we put in a proper packet form. Once these toxic elements are put, these are also properly lined cells in the ground, lined cells with the Leachate Treatment Plant. There are 23 such plants which are there in the country now. At least the large industrial estates are all covered and nothing is going out. After evaporation, the solid residues – I am talking about the solid toxic and hazardous residues – are being properly managed."

8.38 He further went on to explain the storing process :

> "They are lined land cells. We call it ‘leach’. Now, this ‘leach’ comes out. Of course, after five or six years, the old material under the ground leaches. This seepage goes into the Leachate Treatment Plant under the ground. After that, that is sampled."

8.39 On a specific query as to whether the final product is properly certified for its non- toxic and non hazardous nature, the Secretary, MoEF replied in the affirmative and stated that it was done by the laboratory in each of the Treatment Storage Disposal Facility (TSDF).

CHAPTER – IX

PLANNING FOR CONTROL OF POLLUTION OF RIVERS, LAKES AND GROUND WATER

I. ABSENCE OF INVENTORY OF WATER BODIES AND KEYSTONE SPECIES ASSOCIATED WITH THEM

9.1. Inventorisation of rivers/lakes and the species associated with them, forms a key step in planning the control of pollution in aquatic resources, the absence of which reflects deficiencies in the planning process. Audit Report pointed out dismal compliance by the States in terms of enumeration/ identification/quantification of indicators and the absence of a comprehensive inventory of rivers & lakes. The Ministry of Environment & Forests has not been able to adopt a wide-ranging approach towards identifying pollution levels in different water bodies because of its focus on chemical indicators and lack of attention to biological indicators. The risk assessment procedures of MoEF/CPCB and the States were deficient as they failed to carry out comprehensive identification and quantification of human activities which impact water quality and the different sources which affect water quality. No agency in the Country has assessed the risks of polluted water in rivers/lakes/ground water to health and environment. The enforcement of standards of water quality is, therefore, bound to meet with limited success given that MoEF had not adopted the basin-level approach for control of pollution of rivers and lakes and also not developed water quality goals and corresponding parameters for each river/lake. As such, overall planning for the control of pollution on part of MoEF and the States was inadequate which would have concomitant repercussions on implementation of programmes for control of pollution and their outcomes.

9.2. A prerequisite of efficient protection of water resources against pollution is the preparation of a comprehensive and detailed plan of protection which takes into consideration all point and diffuse sources of pollution, pollution

processes and movements, consequences and all possible structural and administrative measures of protection against pollution. In order to make comprehensive and workable plans to tackle water pollution, it is necessary to establish databases on the availability of all types of hydrologic data at the national level and to identify surface and ground water resources and potential sources of water supply and prepare national profiles. Audit findings pointed out that at the Centre, detailed inventory of rivers and lakes had not been made by MoEF. MoEF stated that no survey to identify all rivers and lakes was done and no identification and classification of rivers and lakes as major/minor rivers and lakes had been done by it. Since assessment of ground water resources in the Country was not in the mandate of MoEF, the same has reportedly not been done. Audit observed that the Ministry of Water Resources operates a Ground Water Information System which maps, among other things, hydrological boundaries, land use, drainage and water level. In the States, with respect to inventory of rivers, lakes and ground water resources and identification of keystone species, audit scrutiny showed that only eight States had prepared an exhaustive list of rivers running in their States; and only four States had carried out a survey to identify the lakes in their States and 14 States had carried out district-wise assessment of ground water resources.

9.3. Audit further observed that in the absence of an inventory for rivers and lakes, MoEF, which is the nodal Ministry for pollution related issues in India, would not have adequate knowledge and information for a complete understanding of quality and quantity of water resources which is the key part of the platform for setting objectives for water pollution prevention and control and implementing responses to it. The absence of such data base will further hamper the water pollution management by the States.

9.4. Audit findings pointed out that at the Centre, MoEF has not identified keystone species which is so critical to an ecosystem that its removal could potentially destroy the entire system associated with each river and lake for

major river systems and lakes in India. This has been done only in the case of Ganga River where river dolphin was identified as a keystone species. Such identification is imperative as it would not only act as indicator of the health of the eco-system but would also help MoEF to design programmes to protect species threatened by water pollution and in the States only Himachal Pradesh had identified keystone species associated with some of the rivers running in their States. In June 2011, MoEF stated that identification of keystone species was location-specific and need-based and that it had notified the Gangetic River Dolphin as the national aquatic animal. However, the reply was silent about preparation of inventory of keystone species for other major river systems and lakes in India.

9.5. As per the allocation of Business Rules, MoEF is tasked with the conservation of lakes and wetlands as also the management and abatement of pollution of rivers. In the absence of a complete inventorisation of water bodies, the Committee sought to know how does MoEF intend to fulfill their mandate as per the Allocation of Business Rules. The MoEF thereupon merely replied that the Ministry through Central Pollution Control Board (CPCB) has been preventing and controlling pollution of lakes and rivers by enforcing the provisions of the Water (Prevention and Control of Pollution) Act 1974 and the Environment (Protection) Act, 1986.

9.6. The Committee sought to know what action was being taken/ proposed by MoEF to address the issue of preparation and consolidation of inventory of all water bodies in the Country and whether any timelines have been chalked out. The MoEF submitted that the inventory of water bodies is published by Govt. of India in respect of major, medium and minor rivers and their tributaries. The monitoring network is largely designed on the major medium and minor rivers and their tributaries. In respect of streams and rivers not mapped by irrigation departments and survey of India, need based information is collected from local authorities and monitoring locations are established in compliance of the criteria

for setting up of monitoring locations. There was a requirement for comprehensive inventorisation of water bodies in the Country and the efforts made by National Remote Sensing Centre (Formerly NRSA) will be reviewed and information obtained to fulfill the requirement of inventorisation of water bodies.

9.7. In this context, the Committee sought to know whether requisite data on water bodies have been made available by the NRSC in this regard. The MoEF replied that Central Pollution Control Board (CPCB) was in communication with National Remote Sensing Centre (NRSC) to process the data and the same shall be updated through NRSC.

9.8. With immense potential of the Satellite Remote Sensing data for such applications as inventorisation of water bodies, the Committee felt the need for more concerted efforts to use such cost-effective technologies by way of proper linkages and coordination with the NRSC. The MoEF thereupon responded that the Central Pollution Control Board (CPCB) will design long term programme with National Remote Sensing Centre (NRSC) to harness the potential of Remote Sensing.

9.9. On a pointed query as to what institutional arrangement was being made for supply of such Remote Sensing Data, the MoEF stated that National Remote Sensing Centre (NRSC) being a Government Department under Deptt. of Space, coordinated study will be commissioned by MoEF for procurement of Remote Sensing Data.

9.10. On further being asked as to whether adequately skilled and trained technical staffs were available to process and collate such Remote Sensing data, the MoEF stated that the process of collecting and collating the Remote Sensing data may be out sourced to overcome shortage of man power.

9.11. The Committee pointed out that there was a move towards institutionalising of Remote Sensing Satellite Applications in various Ministries/Departments in view of its immense potential as cost effective means in the management of natural resources. On being asked as to whether any positive move has been made by MoEF in this regard, it was submitted that National Remote Sensing Centre (NRSC) was being contacted for procurement of Remote Sensing data and procurement shall be worked out through MoU mode.

9.12. The Road Map brought out that the endeavour of MoEF for a comprehensive inventory of all rivers, lakes and ground water sources in India, under the National Water Quality Monitoring Programme carried out by Central Pollution Control Board/State Pollution Control Boards, water quality monitoring was being presently carried out at 1700 locations in the main stream of rivers, tributaries, lakes, tanks, ponds, creeks, canals etc. In addition, Groundwater quality monitoring was being carried out at 15,000 stations mostly in rural areas by Central Ground Water Board. The water bodies not meeting the desired water quality criteria are identified as polluted river stretches/water bodies. 10 river stretches not meeting the desired criteria were identified during 1988-89. The polluted stretches increased to 37 during the year 1992 covering all the major river basins. With the rapid growth in urbanization, industrialization, increase in population, subsequent expansion of monitoring network and coverage of more number of rivers for regular monitoring, the number of polluted water bodies identified in 2010 increased to 150. The polluted river stretches were intensively surveyed by Central Pollution Control Boards (CPCB) and State Pollution Control Boards (SPCBs) to identify the sources of pollution such as Urban Centres and Industrial Units. The deviation of water quality from the desired water quality criteria in the data generated by CPCB for the river Ganga formed the basis for launching Ganga Action Plan (GAP) and gradually extended to other polluted rivers through National River Conservation Plan (NRCP). The Road Map further stated that WQAA has issued necessary

guidelines to all State Governments for preparation of Water Quality Management Plan. Besides the Ministry of Water Resources has launched a web based Ground Water Information System (GWIS) on 22nd October, 2010 for data dissemination to all Stakeholders and end users. The India-WRIS project, a joint venture of Indian Space Research Organisation (ISRO) and Central Water Commission with the vision to take water resources data available in standard GIS form to user community by collecting all such data available through various sources, as well as the WQAA website wherein information related to pollution of both surface and ground water sources are made available forms the data base on water pollution.

II. IDENTIFICATION OF EXISTING POLLUTION LEVELS IN TERMS OF CHEMICAL AND BIOLOGICAL INDICATORS

9.13. Chemical indicators like BOD, COD, faecal coliform and total coliform are traditional methods of water quality which provide an indication of organic pollution. However, due to complexity of effluents now entering the water bodies and the inability to develop analytical methods for each and every pollutant, use of biological indicators assumes importance. Biological monitoring goes beyond the conventional measures of water quality to address questions of ecosystem function and integrity and gives a complete picture of the extent of pollution of rivers, lakes and groundwater in India.

9.14. Audit findings pointed out that at the Centre, identification of chemical indicators of water pollution like faecal coliform, total coliform, dissolved oxygen and biochemical oxygen demand in rivers and lakes was done by MoEF under the National River Conservation Programme and by CPCB under the Monitoring of Indian National Aquatic Resources (MINARs) programme. CPCB had also identified chemical indicators of pollution of ground water in the Country like arsenic, nitrate, iron, fluoride and salinity. Identification of indicators of pollution by industries which emit contaminants had been done by CPCB by means of indicators like anions, other inorganic ions and micro pollutants. However, audit

pointed out that these were tested only once a year. This assumes significance in terms of the high levels of industrial pollutants which were being discharged into rivers, lakes and ground water in India. Audit also observed that CPCB had identified biological indicators (benthic macroinvertebrates) for some rivers in India such as Yamuna, Narmada, Krishna, Cauvery, Tungabhadra, Gomti, Kosi, Mahanadi and Brahmani. However, such identification was not done for each river in India due to insufficient infrastructure facilities. Further, biological indicators had not been identified for any lake in India by MoEF/CPCB. MoEF stated in its reply of June 2011 that it had carried out studies relating to biological indicators and also identified some limitations of such indicators. It was stated that though biological indicators reflect the effect of pollution on the water bodies, they can only supplement but not replace the chemical indicators.

9.15. On a pointed query as to why was it that keystone species have been identified only in the case of River Ganga, the MoEF stated that identification of keystone species was location specific and need based. The Ministry had notified the Gangetic River Dolphin as the National Aquatic Animal and an Action Plan for conservation of Gangetic Dolphin had been prepared for implementation. Bio-indicators in various stretches of river Ganga, starting with 'Mahaseer' the cold water fish in the upper reaches of Ganga, Turtles in the stretch from Narora in U.P. to Kanpur, Dolphins from Allahabad to Rajmahal in Bihar and general fisheries including Hilsa in the lower stretch of Ganga has been identified. The CPCB had observed that the keystones (ecology) species can only be identified and recorded when adequate flows were maintained in the river which was not the reality in present conditions. The natural flow in rivers and streams had reduced drastically due to diversion of water for irrigation from all the reservoirs in the country. Thus, there was little fresh water flow or flow generated due to discharge of sewage and industrial effluents. In such situations, the keystone species cannot be identified.

9.16. On being asked to state the reasons for biological indicators not being identified by the Centre for most rivers and none of the lakes as pointed out in the Audit Report, the MoEF stated that CPCB identified biological indicators during the development and testing of bio- monitoring method on 39 rivers and tributaries of River Yamuna Basin, Rivers of Assam, Meghalay components, Nagaland, Manipur, Sikkim, Mizoram, Uttarakhand, Karnataka and Kerala (on-going). CPCB had also identified biological indicators for few major rivers in India such as River Yamuna, River Narmada, River Cauvery, River Tungbhadra, River Gomti, River Kosi, River Mahanadi and River Brahmani. It was further submitted that due to insufficient infrastructure facilities in CPCB and SPCB, the biological indicators could not be developed for each river in India and there was need to augment the natural flow in rivers and streams which had reduced drastically due to diversion of water for various purposes including irrigation, as a result of which the aquatic ecosystem was getting impacted for undertaking realistic assessment of bio-indicators.

9.17. On the issue of identification of keystone species associated with each river and lake in India, the Road Map stated that, identification of keystone species is location specific and need based. The Ministry of Environment and Forests has notified the Gangetic River Dolphin as the National Aquatic Animal. An Action Plan for conservation of Gangetic Dolphin has been prepared for implementation. MoEF has identified bio-indicators in various stretches of river Ganga, starting with 'Mahaseer' the cold water fish in the upper reaches of Ganga, Turtles in the stretch from Narora in U.P. to Kanpur, Dolphins from Allahabad to Rajmahal in Bihar and general fisheries including Hilsa in the lower stretch of Ganga.

9.18. On the issue of developing Biological Indicators, the Road Map stated that CPCB has carried out various studies on biological indicators and published the various Newsletters on Bio-mapping of Rivers- A Case study of Assam state August 2005; Bio-monitoring of Wetland in wildlife Habitats of India Part-1 – Bird

Sanctuaries July 2003; Bio-monitoring of Wetland in India Part-II – Bird Sanctuaries January 2005; Bio-Monitoring of rivers – A case study of Meghalaya state- August 2004; Bio-monitoring of water quality in problem areas – April 2001.

9.19. Based on the above experience CPCB has found that there are some inherent limitations to biological monitoring of water bodies in the country, viz.,

- Biological monitoring cannot be carried out during July to November months due to floods
- It needs highly specialized taxonomists for identification of species in the rivers
- Biological Monitoring cannot be done in highly polluted stretches, since those places are devoid of life or invested with monoculture due to eutrophication.
- Rivers do not have adequate continuous flow to harbor an ecosystem
- The rivers are not properly cannalised

9.20. It further stated that biological indicators reflect the effect of pollution on the water bodies. Biological indicators for non-polluted stretch should be the same for polluted stretch. However, biological indicator can only supplement but cannot replace the chemical indicators which are the real indicators.

9.21. On the issue of identification of biological indicators associated with each river and lake in the country, the Committee was informed that due to insufficient infrastructure facilities in CPCB and SPCBs, the biological indicators could not be developed for each river in India. There was need to augment the natural flow in rivers and streams which has reduced drastically due to diversion of water for various purposes including irrigation. As a result the aquatic ecosystem was getting impacted for undertaking realistic assessment of bio-indicators. In this context, the Committee sought to know what constraints were being faced in

augmenting infrastructural facilities of the CPCB and SPCB. The MoEF replied thereon that there was need to upgrade existing infrastructure of laboratories along with provisions of adequate manpower and budget for undertaking the studies. At the State level, the Pollution Control Boards/ Committees have little autonomy, to create posts, recruit scientists and engineers etc. Moreover, they have to seek approval of State Government in advance which was often not forthcoming.

9.22. On the issue of augmenting the natural flow in rivers and stream so as to enable a realistic assessment of bio-indicators, the MoEF submitted that there was urgent need to augment the natural flow in rivers and streams which had reduced drastically due to diversion of water for irrigation from all the reservoirs in the Country. As a result the aquatic flora and fauna were unable to move in rivers and streams. Thus, there was need for fish ladders in all the reservoirs, barrages and dams for free movement of aquatic life.

9.23. On the need to increase efforts towards effective water conservation so that diversion of water for various purposes which was impinging on the natural flow in rivers and stream were minimized, the MoEF submitted that there was need for taking various steps in water conservation in agricultural practices and recycling of used water along with harvesting of rain water. It was further submitted that diversion of entire flow of the rivers/streams should be stopped and policy framework on adequate natural flow of water for aquatic life needs to be enforced.

9.24. The Committee have further been informed that it was imperative to first reach some normal standard level of physico-chemical characteristics and allow the particular system to regenerate into its pristine from, before fixing bio-indicators as it may be a dangerous and misguiding option to go only by these indicators in the present state of heavy pollution in the water. In this context, the Committee sought to know about the aforesaid normal standard level of physico-chemical characteristics. The MoEF thereupon stated that the normal standard

level of physic chemical characteristics of water indicates that it is tasteless, odourless and colorless liquid which only contains normal constituents of terrain it had passed through and that there was total absence of foreign matter which was not normal part of water.

9.25. The Committee further sought to know whether any forseeable timeline for regeneration of polluted water bodies into its pristine form can be forecasted going by the present rate of implementation of water pollution control activities. The MoEF thereupon replied that the Planning Commission has set target to clean all polluted river stretches by the year, 2017.

9.26. Given the fact that biological indicators go beyond the conventional measures of water quality to address questions of ecosystem function and give a complete picture of the extent of pollution of rivers, lakes and ground water in India, the Audit has recommended that MoEF/CPCB and most States need to intensify their efforts in identification of biological indicators. The Committee sought the comments of MoEF on this aspect and whether they were taking any serious step towards such identification as a supplement to the chemical indicators of water pollution. The MoEF submitted that the identification of biological indicators in aquatic resources are required for maintaining ecology. However, due to insufficient infrastructural facilities in Central Pollution Control Board & State Pollution Control Board and absence of adequate flows in the riverine system, indicator species for each aquatic system could not be demarcated. The biological indicators especially region specific fishes have to be demarcated based on the studies carried out by various organizations involved in fisheries research including Central Fisheries Research Institute, Directorate of cold water fisheries, Estuarine fisheries research, etc. There was need to sponsor comprehensive studies to review the research activities already carried out by various organizations rather than duplicating the efforts. The biological indicators have the capability to detect low level concentrations of

combination of pollutants assessed as toxicity which was not measurable through chemical testing.

9.27. On the issue of eco-flows of water, the Committee have been informed that it should be insisted that such eco-flows are maintained. In this context, the Committee further sought to know how eco-flows were maintained. The MoEF stated that nature has formed rivers and their uninterrupted flows are maintained by the catchment area which naturally stores water in soil and green covers of earth and releases water in the river slowly and gradually. The ecological flows varies from season to season in time and space. The eco flows could be maintained by utilizing the river water in a sustainable manner. The dams constructed across the river by riparian States for irrigation or power generation need to release atleast minimum water required for maintaining the ecological flow in the rivers. However, due to scarcity of water and excessive use for various competing uses, the requirement of fresh water falls short of actual available to maintain eco flows in the rivers.

9.28. On a pointed query as to whether there were existing conditions in water bodies adequate for such maintenance of eco-flows of water, the MoEF stated that the water holding structures –Barrages/dams need to release water during lean season as the flows during rainy season are ecological flows and the water bodies have capacity to maintain flows.

9.29. On the steps needed to be augmented to maintain adequate eco-flows of water, the MoEF stated that political as well as administrative decisions were required to allocate water for ecology as a stakeholder so that the water bodies have aquatic life that needs adequate flow for their sustenance.

9.30. On a pointed query as to whether there were any existing regulation in this regard, the MoEF stated that as such, there was no regulation at present. Ministry of Water Resources constituted a Committee to work out methodology without giving weightage to aquatic life as a parameter and suggested only a

percentage share of dependable flow based on overseas research for these Countries which is impractical in India.

9.31. On the issue of identification of bio-indicators, the Secretary MoEF submitted during evidence as under:

."..we have physico-chemical standards of all water bodies, natural as also manmade. But we do not have bio-indicators, say, for the Gangetic Dolphin or the Godavari crocodile."

9.32. About the evolved species of fish in local water bodies and the risk to health, the witness testified:

"But the problem is that when these water bodies are not even meeting the physico-chemical characteristics in terms of industrial, domestic, agricultural pesticide pollution, there are evolved species which are available which will misguide us completely in terms of remedial action. Now, one is what is known as metal eating carp. There is a carp, which means *Rahu* fish. This fish is normally eaten by everybody, but if you eat this one you are going to be infected. It is an evolved species of carp which can be used for treatment of water. It can eat heavy metals like mercury and other things and so if you eat it, then you will also have the same metal inside your body. This is the kind of bio-indicators today in our lakes and rivers which is very dangerous and we cannot go by this. So, this is imperative for us to first reach some level of physico-chemical characteristics which are of some normal standards and then allow the particular system to regenerate into its pristine form and then only go for fixing bio indicators. This is another submission I wanted to make on the C&AG report."

III. IDENTIFICATION AND QUANTIFICATION OF CONTAMINANTS/ HUMAN ACTIVITIES THAT IMPACT WATER QUALITY.

9.33. A wide range of human and natural processes affect the biological, chemical, and physical characteristics of water and thus impact water quality. Contaminants and assessment of risks of polluted water to environment and health can harm aquatic ecosystems and make water unsuitable for human use. Audit findings pointed out at the Centre, identification and quantification of contaminants like nutrients, erosion and sedimentation, water temperature, acidification, salinity, pathogenic organisms

(bacteria, protozoa and viruses), human produced chemicals and other toxins, introduced species and other biological disruptions etc., had not been done in respect of any river or lake in India by MoEF, CPCB or by MoWR. Identification and quantification of pollution levels in ground water in terms of arsenic, nitrate, iron, fluoride and salinity in ground water for each of the States in India has been done by CGWB. However, no identification and quantification has been done regarding presence of nutrients, human produced chemicals and other toxins in ground water. In June 2011, MoEF stated that CPCB had undertaken comprehensive studies/inventories of pollution sources and their effect in river basins like Ganga, Brahmaputra, Brahmini, Sabarmati, etc., and published a document on assessment of industrial pollution which provided the pollution load from major industries. MoEF also stated that control of agricultural pollution was difficult and Ministry of Agriculture needs to devise suitable policy in this regard. CPCB had conducted studies on pollution sources and their effects between 1980 to 1995. The studies did not cover all rivers and all sources of pollutants.

9.34. Numerous human activities including agriculture, industry, mining, disposal of human waste, population growth, urbanisation, climate change, etc. impact water quality. Agriculture can cause nutrient and pesticide contamination and increased salinity and nutrient enrichment has become one of the most widespread water quality problems of the planet. Audit findings at the Centre MoEF/CPCB/MoWR have not carried out assessment and quantification of the effect of activities which affect the quality of water in rivers and lakes from an activity-based perspective such as mining or agriculture, or industrial sector. The water quality monitoring was presently carried out by CPCB's 1700 monitoring stations including 490 locations for ground water on the basis of 28 parameters consisting of physico-chemical and bacteriological parameters. Further, CGWB had carried out only a few special studies regarding the effect of human activities on ground water like agriculture and uncontrolled disposal of human waste on the quality of ground water. Audit further pointed out that no studies have been carried out by MoEF/CPCB to probe the effects of industrial activities

like paper mills, pharmaceutical industry, chemical plants, distilleries, tanneries, oil refineries, sugar factories and mining. While in the States with respect to assessment and quantification of the effect of activities which affect the quality of water in rivers and lakes, audit scrutiny revealed that with regard to quality of water in rivers, effect of agriculture had been assessed only by six States; effects of industrial activities had been assessed only by 12 States; effects of mining had been analysed by only two States; effects on the water system infrastructure had been assessed only by three States; in respect of the effects of uncontrolled disposal of human waste had been assessed by only four States; in respect of the quality of water in lakes; the effect of agriculture had been assessed by four States; effects of industrial activities had been assessed by six States; effects of uncontrolled disposal of human waste had been assessed only by two States; quality of ground water; Effects of agriculture had been assessed only by seven States in respect of effects of industrial activities had been assessed only by nine States, effects of uncontrolled disposal of human waste on quality of water in the ground water had been assessed only by four States, effect of mining on the quality of ground water had not been assessed by any State.

9.35. Polluted water in rivers, lakes and ground water poses risks to environment as well as health of people exposed to the polluted water. With respect to assessment of risks, audit scrutiny revealed that at the Centre, MoEF had not identified wetlands associated with each river/lake and no identifications of risks to these wetlands due to pollution of river water/lake water had been carried out by MoEF/CPCB. Further, MoEF/CPCB had not identified the major aquatic species, birds, plants and animals facing risks due to pollution of rivers and lakes. As such, MoEF/CPCB was unaware of the risks being faced by the environment as a result of pollution of rivers and lakes.

9.36. Audit observed that risks to human health from water borne diseases and water based diseases as a result of pollution of rivers and lakes had not been

assessed by MoEF/CPCB and in 2009, Ministry of Health and Family Welfare reported that 1.14 crore cases of acute diarrheal diseases occurred in India. While in the States, risks to wetlands from pollution of rivers and lakes have been assessed by only two States, none of the States in India have identified the major aquatic species, birds, plants and animals facing risks due to pollution of rivers; risks to human health from water-borne diseases and water-based diseases as a result of pollution of rivers had been assessed by only seven States; risks to human health from arsenic, zinc, iron, mercury, copper, chromium, cadmium, lead, persistent organic pollutants like dioxins, furans and polychlorinated biphenyls as a result of pollution of ground water had been assessed by only two States.

9.37. Audit therefore concluded that both Union and State governments have failed to conduct comprehensive assessment of risks to environment and health. Such studies on risk assessment would have enabled them to put in place preventive measures to lessen the deleterious impacts of water pollution on human health as well as the fragile freshwater ecosystem.

9.38. The Road Map brought out by MoEF details the comprehensive assessment to identify and quantify the contaminants (chemicals, nutrients, pesticides etc.,) present in each river and lake in India. It has been stated that CPCB has undertaken comprehensive studies/inventories of pollution sources and their effect in various river basins and published various documents. The studies include inventory of potential pollution sources and relevant sub-basin-wise characteristics. They have been undertaken with the objective of formulating action plan to restore and maintain the river water quality at such level as is needed to sustain the designated-best-use of different stretches of rivers. On the basis of such basin-Inventory study, water quality monitoring network is laid down. Regarding industrial pollution, CPCB has published series of industry specific comprehensive documents for Large Pulp and Paper Industry; Sugar Industry; Oil refineries, Tanneries, etc. Besides, CPCB also

published a document on 'Assessment of Industrial Pollution' which provides the pollution load from major industries.

9.39. It was further stated that Water Quality Monitoring Program of the Ministry was limited in scope and coverage, given the resources made available. It was proposed in future to revamp the river water quality monitoring particularly in river Ganga. This will, however, be subject to the availability of adequate resources. Mostly insecticides and pesticides are used in agricultural activity. The enforcement of pollution control laws for such activities leading to diffused pollution is difficult. This can be better tackled through judicious use of pesticides and insecticides in agriculture. The National Environment Policy also recommends taking explicit account of groundwater pollution in pricing policies of agricultural inputs, especially pesticides, dissemination of agronomy practices encourage Integrated Pest Management (IPM) and use of biodegradable pesticides. Government of India, Ministry of Agriculture, Department of Agriculture & Cooperation (DAC) was implementing various programmes for promotion of judicious and balance use of chemical fertilizers, insecticides/pesticides for increasing agricultural production and prevention of water pollution in the Country such as: (i) National Project on Organic Farming (NPOF) implemented from October 2004 to facilitate, encourage, promote development of organic agriculture and promote production and use of bio-pesticides, bio-control agents etc. as alternative inputs in organic farming; (ii) National Project on Management of Soil Health & Fertility (NPMSH&F) to promote soil test based balanced and judicious use of chemical fertilizers in conjunction with organic manures like Farm Yard Manure (FYM), vermi compost and green manure to maintain soil health and fertility; and (iii) Modernization of Pest Management Approach in India by adopting Integrated Pest Management (IPM) as a cardinal principle and main plank of plant protection strategy in overall crop production programme which are being implemented through 31 Central Integrated Pest Management Centres in 28 States and one UT.

9.40. The Road Map also states that the entire impact of human activities like industries, agriculture, mining, urbanisation etc. has been assessed by CPCB under Basin Sub Basin inventory for sewage generation, collection, treatment and disposal and separate documents are produced from time to time. This has helped MoEF to workout targets to regulate pollution causing activity. Ganga Action Plan is one such example which was devised based upon the Basin Study for River Ganga. Other example is the action initiated against the grossly polluting industries. As regards risks to health and environment due to pollution of rivers, lakes and ground water in India, it was stated that risk assessment was taken into account while developing the water quality objective, criteria and standards. Central Pollution Control Board developed certain criteria on the basis of various research works in and outside the Country and accordingly, the following designated best use concepts were developed.

- Drinking water source without conventional treatment but after disinfection
- Outdoor bathing (organised)
- Drinking water source after conventional treatment and disinfection
- Propagation of wild life and fisheries
- Irrigation, Industrial cooling, controlled waste disposal

9.41. While the first three addresses risk to the human beings, and the fourth was concerned with risk to fisheries, birds, wild life etc. Exceeding these criteria with high frequency and high magnitude was the risk associated with aquatic eco system, since Risk was defined Frequency x Magnitude. The encroachment to flood plains also affects the aquatic eco system which harbors the flora and fauna, ultimately leading to entire food chain. Diseases caused as a result of contamination of water are well known and such incidents are also well documented. Necessary precautions are taken by Municipalities/ PHED and other such departments to prevent occurrence of such incidents. Timely remedial actions are also initiated by the concerned departments to control such incidents.

9.42. As regards groundwater it was stated that it comes under the mandate of CGWB under Ministry of Water Resources for which Central Ground Water Authority was formed in January 1997 to regularize indiscriminate boring and withdrawal of ground water in the Country and to issue necessary regulatory directions with a view to preserve and protect the ground water. Ministry of Water Resources was carrying out different specialised studies. In this regard, following reports were prepared during the last year concerning water pollution and mitigation: (i) Report on Ground Water Pollution 'Hot Spots' prepared by Central Ground Water Board under the directives of WQAA, based on the data collected once a year (April/May) through a network of 15640 observation wells located all over the country. The chemical parameters like TDS, Chloride, Fluoride, Iron, Arsenic and Nitrate etc, the main constituents defining the quality of ground water in unconfined aquifers are monitored. Presence of these parameters in ground water beyond the permissible limit in the absence of alternate source has been considered as ground water quality hotspots; (ii) Approach Paper on Ground Water Quality issues in Andaman & Nicobar and Lakshadweep Islands; and (iii) Mitigation and Remedy of Groundwater Arsenic Menace in India - a Vision Document : The vision document contains information about the knowledgebase, understanding and technological opportunities available, state-of affairs of arsenic contamination in India and different corrective measures taken and experience shortcomings. It also brings out a critical appraisal of gaps, identifies areas requiring future initiatives, a comprehensive plan of action envisaging Road Map, financial requirement and the method as to how the mission can be coordinated and accomplished.

IV. DEVELOPMENT OF WATER QUALITY GOALS, CORRESPONDING PARAMETERS FOR EACH RIVER/LAKE AND THEIR ENFORCEMENT

9.43. Water quality goals are the minimum acceptable standard of quality of surface water and ground water which are enforceable by water pollution control agencies via action liable to be taken against agencies that violate such

standards. Basin approach promotes the coordinated development and management of water, land and related resources of the whole river basin to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Audit scrutiny observed that MoEF had failed in development of water quality goals and corresponding parameters for each river and lake and had not established enforceable water quality standards that protect human and ecosystem health. It had only developed water quality criteria for five activities and general standards under Environment Protection Act, 1986 for wastewater discharge to a water body, land and sea. The Environment (Protection) Act (EPA) introduced in 1986 sought to take steps for the protection of environment and prevention of hazards to human beings, other living creatures, plants and property. Section 15 the Act laid down that "whoever fails to comply with or contravenes any of the provisions of this Act, or the rules made or orders or directions issued there under shall in respect of each such failure or contravention, be punishable with imprisonment for a term which may extend to five years or with fine which may extend to one lakh rupees, or both, and in case the failure or contravention continues, with additional fine which may extend to five thousand rupees for every day during which such failure or contravention continues after the conviction for the first such failure or contravention."

9.44. Audit findings further pointed out that MoEF/CPCB have set no water quality goals for the Country and not set any standards for agricultural practices and runoff pollutant levels for rivers and lakes. With respect to ground water, it was observed that standards for agricultural practices and runoff pollutant levels for ground water had not been set by either MoEF or CGWB. CGWB stated that it was outside its purview. No monitoring of pollution caused by agricultural practices and runoff pollutant levels were being done by MoEF/CPCB/CGWB. While MoEF stated that information was available with Ministry of Agriculture and Departments like Indian Council of Agricultural Research, CGWB stated it was outside its purview. Enforceable water quality standards that protect human

and ecosystem health have not been set by MoEF. CGWB stated that it was outside its purview.

9.45. The Committee sought to know whether MoEF/CPCB intend to conduct any comprehensive study to identify wetlands associated with each river/lake and identify risks to these wetlands due to pollution of river water/lake water. The MoEF submitted in their written reply that CPCB had established monitoring network on rivers, lakes, tank, ponds, creeks/sea water, canals, drains and groundwater to assess the level of pollution in these water bodies. The wetlands identified under Ramsar convention were so far not considered for establishing water quality network. The strengthening of monitoring network was underway and during 12th Plan, wetlands notified under Ramsar convention would be considered for establishing water quality monitoring network. CPCB was also monitoring water quality of 107 lakes in India and the water quality is compared to desired water quality criteria. Water quality of lakes exceeding criteria were identified as polluted. CPCB was monitoring coliform group of bacteria which were covering the bacterial population responsible for water borne diseases. The findings of monitoring were disseminated to all the Govt. Departments. The pollution of river/lake/groundwater with respect to specific parameters affecting human health was observed by CPCB in ambient environment and monitoring locations exceeding the desired limits were identified. The respective agency developing water resources for potable uses were required to take appropriate measures before tapping the source for its specific use.

9.46. On being asked as to whether MoEF/ CPCB intend to conduct any comprehensive study to identify the major aquatic species, birds, plants and animals facing risks due to pollution of rivers and lakes, the MoEF replied that CPCB had established monitoring network on rivers, lakes, tank, ponds, creeks/sea water, canals, drains and groundwater to assess the level of pollution in these water bodies. However, at present there is no proposal under consideration of the Government for conducting comprehensive study to identify

the major aquatic species, birds, plants and animals facing risks due to pollution of rivers and lakes.

9.47. On the Audit observation pertaining to non-development of the standards for agricultural practices, MoEF categorically submitted that CPCB had not developed the standards for agricultural practices. Ministry of Agriculture (MOA) and concerned Deptt. are introducing best management practices so that water quality was not affected due to runoff. CPCB is concerned with recipient water bodies and in that context communicated to MOA for awareness of farming communities to use optimum water, fertilizers and pesticides. Central Pollution Control Board had developed water quality criteria under Water (Prevention and Control of Pollution) Act, 1974 and MOEF had notified General Standards under Environment Protection Act, 1986 for industrial effluent discharge to a water body, land and sea. The water quality monitoring of aquatic resources was carried out in accordance to the protocol notified by Ministry of Environment and Forests, which was representing various activities responsible for water quality degradation and various parameters were accountable for one or more activity indicated.

9.48. The Committee sought to know whether the MoEF has taken up the matter with Ministry of Agriculture to encourage Integrated Pest Management (IPM) and use of bio- fertilizers/ biodegradable pesticides, the Ministry submitted that mostly insecticides and pesticides were used in agricultural activity. The enforcement of pollution control laws for such activities leading to diffused pollution was difficult. This can be better tackled through judicious use of pesticides and insecticides in agriculture. The National Environment Policy also recommended taking explicit account of groundwater pollution in pricing policies of agricultural inputs, especially pesticides, and dissemination of agronomy practices, encourage Integrated Pest Management (IPM) and use of biodegradable pesticides, may continue the ongoing programme of Integrated

Pest Management (IPM) and Farmers Field School (FFS) under IPM being implemented by the Ministry of Agriculture in a bigger way to address the issue.

9.49. The Committee sought to know whether the MoEF had taken up the matter with Ministry of Agriculture to devise appropriate programmes and frame suitable policies in this regard, the MoEF submitted that to increase the crop productivity and minimize the use of hazardous chemical pesticides and insecticides, Government of India, Ministry of Agriculture, Department of Agriculture and Cooperation, had launched a scheme entitled "Strengthening and Modernization of Pest Management Approach in India" since 1991-92 by adopting Integrated Pest Management (IPM) as cardinal principle and main plank of plant protection strategy in overall crop production programme. Under the ambit of programme, the Govt. of India had established 31 Central Integrated Pest Management Centers in 28 States and one UT. The mandate of these Centers was pest/disease monitoring, production and release of bio-control agents/bio-pesticides, conservation of bio-control agents and Human Resource Development in IPM by imparting training to Agriculture / horticulture Extension Officers and farmers at Grass Root Level by organizing Farmers Field Schools (FFSs) in farmers' fields.

9.50. On a pointed query of as why other kinds of pollution, like industrial pollution were not considered as source of pollution of rivers, the MoEF stated that the Central Pollution Control Board (CPCB) and the State Pollution Control Boards (SPCBs) were constituted under the Water (Prevention and Control Pollution) Act, 1974 to prevent and control pollution of surface water due to all kinds of pollution which includes industrial pollution. The CPCB and SPCBs plan and execute programmes for prevention and control of surface water due to industrial pollution by regulating effluents discharged in to the surface water. The industrial sources of pollution were monitored regularly with a view to check compliance with respect to the effluents discharge standards. The industries which do not comply with the prescribed effluent discharge standards are

prosecuted under the Water (Prevention and Control Pollution) Act 1974 or the Environment (Protection) Act 1986.

9.51. The CPCB has identified 1395 grossly polluting industries for priority action which were discharging BOD load of 100 kg/day or more. These industries are monitored by the CPCB for control of pollution. The scheme of installation of Common Effluents Treatment Plant was funded by the Ministry to control pollution from clusters of small scale industries. In this regard, financial assistance to the tune of 50 % of project was borne by the Ministry.

V. WATER REGULATORS

9.52. On the issue of tremendous extraction of water for agriculture and irrigation, the Secretary deposed during his oral evidence as under :

"We have also suggested certain measures in regard to tremendous extraction, which is happening on the major rivers mainly for agriculture and irrigation, which is not metered and which is not measured and nor is it controlled by the State Governments. So, what happens is this. No matter what the level of pollution is. The concentrations of pollution increase in the water. Every bit of surface water gets polluted because of lack of dilution rather than excessive pollution.
Another very major aspect, which has to be insisted upon, is that the eco-flows are maintained."

9.53. On a pointed query of the Committee on aspect of regulation of water supply and its distribution for use in various sectors, the Secretary responded during evidence as under :

"Sir. under the Water Act, where the consents are given by the State Pollution Control Board to industry, they mention how much of ground water can be extracted by this industry per day, per month, per year. That is for B category industry. The States do that. For A category industry, we do that. When we issue our consents that is the condition on which the permit is being given, in that we mention very clearly as to how much water they can use from the ground and how much water they can use from the surface."

9.54. On the aspect of regulation of ground water extraction, he supplemented as under:

"Sir, about the ground water, the State Water Ground Water Board is supposed to do it."

9.55. On the drawal of heavy amount of water by multi nationals and industries manufacturing cold drinks, etc, the Secretary candidly agreed during his oral evidence that :

"Of course, there is one issue. After the 13th Finance Commission had suggested that water regulators are established by each State, we are not very sure how many will be set up. Besides, there is one thing. When our inspectors go from the State Pollution Control Board or from the CPCB, they check the water meter from where the water is extracted, be it ground or be it surface. So, the industry also has a data logger. From the industry, it is not so difficult for us to know how much water they are using. We can penalise them if they are using excess to their limit."

9.56. On the issue of diversion of water meant for agriculture for industrial use, the Secretary submitted during oral evidence.

"Yes, Sir. That is true. They also temper with the meter and all that. We know, Sir. The major point, we have not covered, is the fact that minus industry, there is no regulation. It is because from the Ministry of Environment, we cannot regulate the farmers for large scale extraction for irrigation. That is a very important problem, which will have to be solved by the Irrigation Department.

9.57. On the issue of water regulators to monitor the extraction of water from water bodies resulting in consequent concentration of pollution, the Committee have been informed that the 13th Finance Commission had suggested that water regulators be established in every State. In this context, the Committee sought the present status of setting up of water regulators. The MoEF thereupon stated that as such there was no single water regulator for the whole country, but depending upon requirement, State Department of Irrigation do regulate quantity of water supplied to farmers for irrigation, drinking etc. Also, total release of water for variety of uses from multi-purpose Dams, was regulated by Public

Health Engineering Department, various Boards constituted for power generation and Irrigation etc.

9.58. In the face of large scale extraction of water taking place for agricultural uses, the MoEF was asked whether the need to monitor such extraction was felt especially in view of its impact on pollution of water, the MoEF merely stated that the Ministry of Water Resources may regulate quantity of water required by farmers and prepare guidelines for its efficient use.

9.59. On being asked as to what the Ministry has done/proposed to do regarding this aspect, MoEF stated that Water being a State subject, it need to be discussed with all stake holders before a decision was taken. Suitable constitutional amendments may also be made to bring Water under concurrent list of the constitution to improve water sector in a holistic manner, as at present it was a State subject except for inter State rivers.

9.60. It had been reported that China is planning to divert 200 billion cubic meters (BCM) of water from the Brahmaputra river to feed its Yellow river. The Committee sought the comments in this regard and also to indicate whether there were adequate regulatory mechanisms to detect and prevent such large scale diversions of water, which will have serious implications on the nation. MoEF stated that at present there was no central regulator for large scale water diversion for variety of uses. The existing mechanism functioning at State level has more or less delivered as per the aspirations of the people. The increasing population and rapid industrialisation will put fresh demand on existing resources. As the availability of fresh water decreases with time, the shortage of fresh water will further go down due to water pollution. However, to prevent inter State problems and regional imbalance, a central regulator is required. Inter linking of rivers will add new dimension to the issue.

VI. POLLUTION FROM AGRICULTURAL SOURCES

9.61. As pollution from agricultural sources is one of the biggest non-point source of pollution, the Audit had recommended that MoEF in conjunction with Ministry of Agriculture needs to develop standards of pollutants like nitrogen, phosphorus etc., which arise from agricultural practices, use of pesticides and fertilizers, besides establishing enforceable water quality standards for rivers, lakes and ground water that would help protect human and ecosystem health. In response to this, the Ministry in their Road Map had stated that as pollution is to be controlled at the generator stage, MoEF has notified standards for discharge of pollution in the water courses/land/sewers etc. besides guidelines have been made for use of fertilizers/pesticides etc., to minimize their impact on the environment. In this context, the Committee sought to know how were these notified standards and guidelines going to be enforced. The MoEF thereupon submitted that, the Standards for discharge of treated industrial effluent and sewage were notified under Environment (Protection), Act and the provision of Water (Prevention and Control Pollution) Act, 1974 were being used by the State Pollution Control Boards for enforcement. However, in case of agriculture related sources of pollution, being non point sources, role of MoA in educating the farmers was needed. Under Department of Agriculture & Cooperation (DAC)'s Central Sector Scheme "Mass Media Support to Agricultural Extension", Doordarshan and All India Radio were being utilized to make the farmers aware about modern farm technologies and researches related to agriculture and allied areas. For telecasting success stories, innovations and for popularization change-setting technology and farming practices through the Saturday slot of Doordarshan's National Channel, DAC was producing films, which consciously project *inter-alia* positive aspects in agriculture in India. A "Focused Advertisement Campaign" was launched through print as well as electronic media to create awareness about the assistance available under various schemes of the Department of Agriculture & Cooperation. The advertisements were released through national as well as regional newspapers. The audio-video spots were being broadcast/telecast through AIR, Doordarshan and Private Channels operation at National & Regional Level. Under this campaign, one of the Audio-

Video spots produced was on “Judicious Use of Fertilizers” and the same was being telecasted through Doordarshan and Private channels to create awareness among the farmers about the benefit of using fertilizers judiciously, for cultivation as well as abatement of pollution of rivers, lakes etc.

9.62. The Ministry further submitted that in addition, Ministry of Agriculture was imparting awareness to the farming communities for judicious use of agriculture chemicals in their crops through various human resource development programmes (2 days, 5 days, 30 days Season Long Training Program (SLTP) and Farmer Field Schools (FFSs) – 14 weeks – once a day in one village) under Integrated Pest Management (IPM). The Scheme was being implemented Country-wide through 31 Central Integrated Pest Management Centres (CIPMs) located in 28 States and 1 Union Territory. Since 1994, up till March 2012, the Directorate of Plant Protection, Quarantine and Storage (PPQ&S), under Department of Agriculture & Cooperation (DAC), had organized 13991 Nos. Of Farmers Field Schools (FFSs) wherein 57962 Agriculture/Horticulture Extension Officers and 4,20,720 farmers had been trained on latest Integrated Pest Management (IPM) technology in various crops. So far, 1871 master trainers have been trained in 51 SLTPs in different crops like Rice, Cotton, Vegetables, Groundnut, Mustard, Soyabean, Gram/Tur, Chillies and Sugarcane. Also Integrated Pest Management (IPM) package of practices for pests/diseases management in 77 major crops had been developed in collaboration with State Departments of Agriculture/Horticulture/Indian Council of Agricultural Research (ICAR) Institutions/State Agriculture Universities (SAUs) which had been circulated to all States/UTs and had been posted on Directorate of Plant Protection, Quarantine & Storage’s (DPPQ&S)’s Website www.dacnet.nic.in/ppin for use by the extension functionaries and the farmers.

9.63. On a pointed query of the Committee as to who will ensure that strict adherence to these standards/guidelines were made, the MoEF stated that the standards in the form of guidelines may be enforced through existing

mechanism which includes block level officer (BDO), Patwaris etc, who may advise the farmers regarding environment friendly practices with respect to water, fertilizers and pesticides application and also social service activist, NGOs etc may help in implementation and spread of guidelines. However, the impact of guidelines on water quality may be monitored by Central Pollution Control Board and State Pollution Control Board.

9.64. On the aspect of penalties/fines, if any, in case of deviations and whether they will have the desired deterrent effect, the Ministry admitted that from notified standards at this stage when standards in the form of guidelines are to be enforced for farm practices, penalties and fines may not be proposed. However, after considering the long term compliance, it may be included at a later stage.

9.65. On the steps being taken/ proposed by MoA to control water pollution caused by runoff from agriculture like fertilizer runoff and chemical pesticide runoff, the MoEF submitted that besides the steps initiated by Ministry of Agriculture for mass awareness and farmers schools, efforts were made for enhancing production of bio-control agents and bio-pesticides. At present, there were 351 bio-control laboratories functioning in India for production of bio-control agents and bio-pesticides set up by different agencies viz. Central Government, State Governments, ICAR, SAUs, Department of Bio-Technology (DBT), NGO's kand Private entrepreneurs. Grant in aid of ₹ 1772 lakh and ₹ 64.15 lakhs was provided to States and Non-Governmental Organizations (NGOs), respectively for setting up of bio-control laboratories in different States and UTs. Besides, ₹ 353.73 lakhs has been granted for rodent pest management in North Eastern States.

9.66. On categorically been asked to state as to whether there were any guidelines to ensure that these agricultural wastes were suitably treated before being allowed to be discharged into the rivers and lakes, the MoEF replied that

no such guidelines exist to ensure that agricultural wastes were suitably treated before being allowed to be discharged into the rivers and lakes. However, the functionaries of central and state governments impart training to farmers in judicious use of pesticides, which led to increased use of bio- pesticides and reduced use of chemical pesticides.

9.67. On being asked as to whether MoA had commissioned any study on the harmful effects of use of fertilizers & pesticides and to provide the results of the study and recommendations to the Committee, the MoEF stated that a writ petition (civil) No.213 of 2011 was filed in Hon'ble Supreme Court requesting inter alia for ban of Endosulfan. The Supreme Court passed an ad-interim order on 13.5.2011 banning production sale and use of Endosulfan in the Country till further orders. The Court appointed a Joint Committee headed by the Director General of Indian Council of Medical Research (ICMR) and the Commissioner (Agriculture) to conduct a scientific study on the question whether the use of Endosulefan would cause any serious health hazard to human beings and would cause environmental pollution. Accordingly, ICMR conducting study on the effects of pesticides including Endosulfan on human health and reference to different exposures (inhalation, intake via food and drinking water etc.) Objectives of the study was – (a) to evaluate the health status of the population at high risk to pesticides exposure (including Endosulfan); and (b) to estimate pesticide levels in biological fluids, such as blood and/or urine.

9.68. On the regulations for the use of synthetic pesticides and fertilizers, the MoEF submitted that the Insecticides Act, 1968 and the Insecticides Rules, 1971 were being implemented to regulate the use of synthetic pesticides.

9.69. On the steps being taken by MoA to develop alternative sources of fertilizers, insecticides and pesticides, which have less harmful effects on quality of water because of agricultural runoff, the MoEF submitted that under the promotion of IPM component of the scheme of "Strengthening and Modernization of Pest Management approach in India", various alternatives like

the use of bio-pesticides including microbial, botanical pesticides and bio-control agents is being promoted to reduce the harmful effects of chemical pesticides and to avoid water pollution. Further, the scheme “National Project on Management of Soil Health & Fertility” (NPMSH&F) had been taken up from 2008-09 to promote balanced and judicious use of fertilizers in conjunction with organic manure on soil test basis. One of the important components was Integrated Nutrient Management (INM) in which use of Organic Manures/ Soil Amendments was being promoted in a big way. Government was providing support to States to encourage organic farming through various schemes like National Project on Organic Farming (NPOF), Rashtriya Krishi Vikas Yojana (RKVY), National Horticulture Mission (NHM) and Horticulture Mission for North-east and Himalayan States (HMNEHS). Financial assistance was provided under these schemes for establishment of organic input production units, adoption of organic farming, certification etc. One of the important objectives of “National Project on Organic Farming” was to encourage production and use of organic and biological sources of nutrients like bio fertilizers, organic manure, compost for sustained soil health and fertility and improving soil organic carbon and to promote production and use of bio-pesticides, bio-control agents etc. as alternative inputs in organic farming.

9.70. On being asked as to whether any R&D projects have been sponsored by the MoA in connection with reducing the adverse effect of agricultural runoff on water quality as well as public health of citizens, the MoEF submitted that a project entitled “Monitoring of Pesticide residue at National Level” had been sponsored in collaboration with ICAR for the study of pesticide residue in food products, soil and irrigated water.

9.71. As regards, release of funds on projects for promoting the use organic fertilizers/ bio-fertilizers/ biodegradable pesticides in agriculture to reduce adverse effects of synthetic fertilizers and pesticides on quality of water and

public health the MoEF submitted that the following allocations made to such schemes during the last three years and the current year:

Table 9.71 : Allocations made for Organic and Bio Fertilisers/Biodegradable Pesticides

₹ in Crore

Name of the Scheme	2009-10 (RE)	2010-11 (RE)	2011-12 (RE)	2012-13 (RE)
Strengthening and Modernization of Pest Management approach in India	**18.13**	**26.44**	**27.99**	**35.00**
National Project on Management of Soil Health & Fertility	**42.71**	**23.85**	**21.59**	**30.00**
National Project on Organic Farming	**21.41**	**18.00**	**17.91**	**21.00**

9.72. On the issue of implementation of any scheme or programme to encourage Integrated Pest Management (IPM) Government of India, Ministry of Agriculture, Department of Agriculture and Cooperation (DAC) launched a scheme “Strengthening and Modernization of Pest Management Approach in India” since 1991-92 by adopting Integrated Pest Management (IPM) as cardinal principle and main plan of plant protection strategy in overall crop production programme. Under the ambit of this IPM programme and the Government had established 31 Central IPM Centres in 28 States and one UT.

9.73. On a pointed query as to whether Ministry of Agriculture plan to set up any standards for agricultural practices and runoff pollutant levels for Water bodies, the MoEF stated that the Bureau of Indian Standards (BIS) considered Integrated Pest Management (IPM) as a good agriculture practice.

9.74. On a pointed query as to whether the Ministry of Chemicals and Fertiliser commissioned any study on the harmful effects of use of chemicals and fertilizers the Ministry replied in the negative and stated that the Department of Chemicals & Petrochemicals has not commissioned any study on the harmful effects of use of chemicals.

9.75. On the query as to whether the Ministry of Chemicals and Fertiliser have regulations on the ban of synthetic pesticides and fertilizers etc. to prevent or regulate their usage, it was stated that the Department of Chemicals & Petrochemicals do not administer any act imposing ban on regulating their use of synthetic pesticides. The use of pesticides was regulated as per the provisions of the Insecticides Act, 1968 which was administered through Department of Agricultural and Cooperation.

9.76. On steps being taken by Ministry of Chemicals and Fertiliser to develop alternative sources of fertilizers and chemicals, which have less harmful effects on quality of water because of agricultural runoff, the Ministry replied in the negative.

9.77. Further, on the aspect of whether any R&D projects had been sponsored by the Ministry of Chemicals and Fertilisers in connection with reducing the adverse effect of agricultural runoff on water quality as well as public health of citizens. The Ministryreplied in the negative and stated that the Department of Chemicals & Petrochemicals had not sponsored any R&D project in connection with reducing the adverse effects of agricultural runoff on water quality as well as public health of citizens.

9.78. On being asked as to whether MoCF has undertaken any projects for promoting the use of organic fertilizers/ bio-fertilizers/ biodegradable pesticides in agriculture to reduce adverse effects of synthetic fertilizers & pesticides on quality of water and public health, the details of funding of such projects by MoCF under such scheme/ programme during 2007-12 the Ministry submitted that the Government of India through Department of Chemicals & Petrochemicals implemented Project Neem emphasizing the Development and production of Neem product as environment friendly pesticides during 2004-2011. The phase-I of the project was taken up during 2004-05 with financial assistance of UNDP/UNIDO with the objective to promote production, processing and use of Neem based products, thereby aiding waste

land development, generating rural employment (especially for women) and providing farmers with eco-friendly/biodegradable pesticides. The phase-II of the project was taken up during 2006-11 with Government of India support with various stakeholders including Agricultural Universities, various crop organizations, Neem Foundation etc. To provide the scientific basis for wider acceptance of the simple low cost technology of Neem based pesticides for use in different crops which are under the threat of persistent residues of highly hazardous toxic chemicals. The project was aimed at enhancing shelf life and toxicological screening criteria to establish a scientific basis of quality control of Neem based pesticides on commercial basis. During phase-II of the project, an amount of ₹ 5.87 crore was actually released to different participating organizations. The project has since been closed.

VII. BASIN LEVEL APPROACH FOR CONTROL OF POLLUTION

9.79. The basin approach is recognized as a comprehensive basis for managing water resources more sustainably and will lead to social, economic and environmental benefits. With respect to planning for control of pollution at the basin level, audit observed that MoEF established a long-term vision for only Ganga river basin as against the 24 major river basins existing in India. For the river Ganga, the National Ganga River Basin Authority (NGRBA) was constituted in February 2009. However, only government level stakeholders namely, Ministers of Urban Development, Water Resources, Deputy Chairman, Planning Commission and Minister of State for Environment were involved in consultations while setting up NGRBA. MoEF had taken very limited action on integration of policies, decisions and costs across sectoral interests relating to pollution such as industry, agriculture, urban development, navigation, fisheries management and conservation, including through poverty reduction strategies. Further, it did not engage in strategic decision-making at the river basin scale which guided actions at sub-basin or local levels. No involvement of private

sector/civil society in investment decisions in the planning process was found. With respect to lakes, no planning was found to have been done according to the basin approach. In June 2011, MoEF stated that the need for a river basin approach for conservation had been already recognised by the Central Government and National Ganga River Basin Authority (NGRBA) had been set up as an empowered planning, financing, monitoring and coordinating authority for the Ganga River with new institutional structures. It further stated that the objective was to have the river basin as the unit of planning, to shift from town-centric to river-basin approach and to have a comprehensive response covering water quality and flow, sustainable access, environment management, prevention and control of pollution in the form of a national mission. While, audit acknowledges the fact that the basin approach had been adopted for conservation of river Ganga, it stated that the MoEF must now start planning similar basin approaches for all the river basins in India, starting with the ones which are the most polluted like River Yamuna.

9.80. A holistic approach in preparing pollution abatement projects is now being adopted for River Ganga. A comprehensive basin management plan is being prepared by a consortium of seven IITs. Instead of standalone STPs, I&D etc., an integrated approach including sewer network is being adopted. Slums and individual houses having no space for household installation of toilets shall also be covered through community toilets. The new approach will ensure full coverage of the city and thereby transportation of entire sewage to STPs for optimal treatment and utilisation. Based on the experience of implementation, this river basin approach will also be adopted for the other rivers in the Country. However, this will also depend on provision of the commensurate level of budgetary resources. The MoEF has circulated revised guidelines for the preparation of DPR in December, 2010. The interception and diversion scheme for sewage collection and treatment has been modified to cover laying of sewers in whole city and dovetailing of schemes sanctioned under JNNUNRM of MoUD etc. The MoEF will continue to monitor water quality through CPCB. Creation of

sewerage network, setting up of STPs etc. are collective and cooperative efforts involving various Central and State agencies which are key stakeholders in the process.

9.81. Notwithstanding the recent initiative of the NGRBA, it was rather distressing that the adage of 'holiest river' has rather become a myth today for River Ganga, as it is reported to be one amongst the five most polluted rivers of the world, with formidable pollution pressures and threats to its bio-diversity and environmental sustainability. The River alongwith its tributaries is the lifeline for 40% of the population of the Country and with efforts to cleanse the river meeting with limited success even after the Ganga Action Plan, heightened concerns of rising pollution level remains one of the burning issues of the nation today. The PAC (2003-2004) had examined the Ganga Action Plan (GAP) and their recommendations/observations contained in their 62nd Report presented to the Houses on 05.02.2004 are of relevance even today indicating that not much has changed in the ground level in terms of pollution control. The Committee had then recommended creation of facilities like Sewage Treatment Plants, Industrial Effluent Treatment Plants (ETPs), to tackle pollution from municipal sewage which accounted for about 75% of the river pollution as well as toilet complexes, electric crematoria, improvement of bathing ghats, river front developments, etc,.

9.82. On the aspect of cost recovery of operation costs of sewage treatment plants for the Ganga River, the Secretary deposed during oral evidence as under :

"In the Ganga case, you mentioned about earlier Ganga project not having worked simply because we paid for only treatment. We did not pay for collection. Today's Ganga project will work because we have taken a holistic and basin approach where each house-to-house connection we are paying for on a 70:30 basis. They are paying 30 per cent and we are paying 70 per cent plus we are giving operation and maintenance 100 per cent coverage for five years. Of course, since we are doing that there is no incentive for the State Governments to slowly start charging. It is because unless they start charging

and put a little subsidy no private person is coming forward to maintain these resources. But one thing is that it has come to the knowledge of the State Governments that it is a very important thing and now we have to talk very seriously."

9.83. On the practical difficulties of cost recovery for sewerage from the common man, the Secretary candidly admitted that :

."..under this model what we have suggested in the NGRBA is that we go for river front development and we give them other revenue tools."

9.84. On problems being faced pertaining to coordination particularly in the Ganga Project, the Secretary testified during oral evidence as under :

"I would say that this authority is very useful to discuss certain problems of coordination. In Ganga, for example, we have lost more than nine months in collection of data from the Ministry of Water Resources. There are seven IITs, who are working on the basin plan. To get data from the Ministry has not been possible. So, this is one of the reasons that I convened this meeting. This is to discuss this and to start having a closer relationship with the Ministry of Water Resources to get this data. Then, we are supposed to get data in respect of soil, which is the riverbed soil, of the Ganges from the authority. This authority is supposed to collect this data. They are not giving this data to another Ministry because of the security reason. How security is connected to the soil of the Ganga, I am not very sure. They are not giving it to us…. the discussion was definitely for all the stations they have for both soil sampling and water sampling.… the point about this authority, therefore, is that by itself it is not useful. But, it is extremely useful as a statutory body to discuss and coordinate in important projects. Without this coordination we could not have done the project the way we are doing. Of course, I request the Mission Director to give more details of it. We have to create an authority. That is the point he was also making to have a regulatory authority or an authority which can control every Ministry and every State Government's Irrigation, Water and Ground Water Departments."

9.85. On the proposal to collect money for cost recovery for sewage treatment, the Secretary deposed as under during his testimony :

"There is a proposal, therefore, that now collection, to the extent that the rich people in the city pay to that extent, to collect and the rest of the money would have to be arranged for the private developer from outside, from other sources. It

is one model and it is working in only few cities. It is not accepted everywhere and we are trying to upgrade it as part of NGRBA discussion."

9.86. The Road Map talks about thrust on 'Innovative River Front Development Projects'. The Committee have also been informed that under the NGRBA, other revenue tools for river front development are being considered. On being asked to state whether any capacity addition has taken place on these fronts and to specify the main thrusts in this regard and indicate as to how they will be more successful in abating pollution of the river compared to the ones that were already in existence the MoEF stated that the main thrust was to achieve Zero Liquid Discharge (ZLD) condition for Sugar & Distilleries, Pulp & Paper and other industries discharging into River Ganga and to achieve the target, major activities under taken by Central Pollution Control Board *inter-alia* included taking up adequacy assessment of Pollution Control Measures taken by Distilleries to finalize the ground level status of ZLD condition in Distillery sector. This will be achieved by using spent wash for compost making used as fertilizer, biogas generation and as source of power generation co-processing of distillery spent wash in cement kiln or through incineration in slope boiler to do away requirement of treatment for spent wash and resultant ash for using as soil conditioner and preparation of a charter for pollution prevention and control in respect to Pulp and paper Industries *viz.* introduction of Biological Treatment Plant in waste paper based industry; improved pulp washing system; reuse and recycle of treated effluent; installation of Chemical Recovery Unit in agro based industry.

9.87. It has been reported that the National Environmental Engineering Research Institute (NEERI) endorsed claims of the Ganga River's 'unique self purification qualities' and have recommended that exclusive environmental guidelines should be considered to preserve the nature's miracle. It has been claimed that Ganga's sediments have uranium and thorium, which produce radiation in high degrees and that, through microbes called bacteriophage, kills the harmful bacteria and brings down coliform levels. In this context the

Committee sought to know whether the Ministry was seriously giving a consideration to such claims which if found true can have immense potential in supplementing efforts in cleansing the river. The MoEF thereupon replied that under the National Ganga River Basin programme, Ministry of Environment and Forest has entrusted Central Pollution Control Board (March, 2011) to implement the project "*Pollution Inventorization, Assessment & Surveillance (PIAS) on Ganga River Basin*" for performance of activities such as inventorization of Grossly Polluting Industries (GPI) discharging into the main stem of River Ganga and its tributaries namely R. Ramganga& R. Kali East. A total of 764 industries had so far been identified which were discharging into the rivers; identification of a total number of 113 drains for the purpose of detailed monitoring during this financial year. It was estimated that 3,200 MLD of waste water was discharged into the rivers by Uttarakhand, Uttar Pradesh, Bihar and West Bengal; monitoring of a total number of 46 Sewage Treatment Plants (STP) out of which 37 were in W.B., 5 in Bihar and 4 in U.P. Out of these 46 STPs monitored, 33 were found in operation and rest 13 were non-functional; and performance evaluation of 3 Common Effluent Treatment Plants (CETP) out of which 2 are in U.P. and 1 in W.B.; and taking of appropriate action on the basis of inspection of CPCB of 126 industries on river Ganga and its tributaries Kali-East and Ramganga during August, 2011 to July, 2012 .

9.88. The Ministry further supplemented that action plan to use cleaner technologies or reduction in waste in Pulp and Paper; Distillery; Sugar; Chemical; CETP and STP thereafter various processes in existence in the Ministry. Further, on critically polluted stretches, reasons and sources of pollution and action taken or proposed; the Ministry identified Polluted stretches in Rivers Ganga; Ramganga; Kali East and stated that reasons of Pollution and mixing of partially treated and untreated waste water by industries and discharge of untreated domestic waste water, agriculture runoff carrying fertilizers and pesticides influx from polluted ground water, unscientific disposal of solid waste

on the banks of the river, non availability of ecological flow in the rivers and unorganized mass bathing.

9.89. The Action Plan of the Ministry also included steps to check unauthorized mining of sand, limestone, etc. As regards institutional strengthening and capacity building, the MoEF submitted that a detailed project report entitled "Strengthening of Environmental Regulators "for the total estimated cost of ₹ 71.66 crores for the 05 SPCBs falling in the Ganga river catchment area and CPCB was under consideration with the Ministry and the project covers the Goods, Training and Consultancy for institutional strengthening. Besides, creation of NGRBA cell in CPCB with effective from December, 2010 in order to prepare detailed project reports and execution of the sanctioned projects; initiative for community monitoring under a detailed project report entitled "Real Time Monitoring System for River Ganga "for the total estimated cost of ₹ 85.40 crores which was under consideration with the Ministry. Whereas out of the estimated project cost, a sum of ₹ 3.36 crores had been earmarked for community monitoring proposed to be undertaken with public participation involving non-government organization, local institutions and social activists; and initiative to control Pollution from Agricultural Sources in accordance with envisaged Road Map for management of water pollution in India through control at the generator stage, by way of notification of standards for discharge of pollution in the water courses /land/sewers etc. besides guidelines for use of fertilizers / pesticides etc. to minimize their impact on the environment have been taken up.

9.90. The Committee have now been informed that the National Ganga River Basin Authority (NGRBA) has been constituted in February, 2009 as an empowered authority for conservation of the river Ganga by adopting a holistic approach with river basin as the unit of planning. The authority has decided that under 'Mission Clean Ganga', it will be ensured that by year 2020, no untreated municipal sewage and industrial effluents flow into Ganga. In this context, the

Committee sought to know whether the recommendations/observations made by the PAC in their GAP Report (62nd, 13th LS) have been given due consideration by the NGRBA, the MoEF submitted in their reply that the need for revamping the river conservation program was widely recognized in view of the shortcomings in the approach followed in Ganga Action Plan (GAP). It was felt necessary that a new holistic approach based on river basin as the unit of planning and institutional redesign may be adopted. The Government of India created the National Ganga River Basin Authority (NGRBA) with the objectives of (a) ensuring effective abatement of pollution and conservation of the river Ganga by adopting a river basin approach to promote inter-sectoral co-ordination for comprehensive planning and management; and (b) maintaining minimum ecological flows in the river Ganga with the aim of ensuring water quality and environmentally sustainable development.

9.91. On a pointed query as to whether there was any demonstrable achievements of the NGRBA in its first three years of existence; the MoEF submitted in their written reply that building on lessons from the past, the vision of the National Ganga River Basin Authority (NGRBA) Program marks a significant departure from the previous efforts, with adoption of a comprehensive, basin-level, and multi-sectoral approach, with support for investments in wastewater, industrial pollution, solid waste and river front management, and efforts to address non-point source pollution and ecological flows in contrast to a town-centric and “end-of-the-pipe” wastewater treatment focus of the previous efforts. The consortium of seven premiere technical institutions (Indian Institute of Technologies) was engaged in preparing dynamic, basin-level management plans. While the process of developing a basin-level approach to planning of the Ganga clean-up had been initiated, the early investments of the NGRBA Program (which include the investments supported by the World Bank assisted NGRB project) had been limited to interventions which were in obvious priority locations and which can make a positive demonstration impact in terms of sustainable operations and water quality

improvements. Since the inception of the NGRBA, 53 schemes in 43 towns of the 5 basin States for an estimated cost of ₹ 2598.47 crores had been sanctioned under the NGRBA Programme, out of which ₹ 496.72 crores had been released, as of June, 2012, for implementation of the projects. Besides, institutional development was recognized as a critical need, given the multi-sectoral and multi-tier agenda of river management. The NGRBA Program aims to develop strong and dedicated operational-level institutions for planning, managing and implementing the program with single-point accountability. Additionally, given the critical role of the ULBs, and serious capacity gaps at the local level at present, important reforms to empowering these was being introduced. To achieve these goals, the National Mission for Clean Ganga (NMCG) at National level and the State Programme Management Groups (SPMGs) at the State level in Uttarakhand, Uttar Pradesh, Bihar and West Bengal had been set up as the Registered Societies, while a dedicated Cell in the UD Department of Jharkhand had been created to implement the programme. Upgradation of the knowledge-base for the Ganga system to ensure that planning and investments were based on adequate and sound information was being planned which will form the basis of a comprehensive, and revamped communications programme to engage various stakeholders. A project proposal for setting up 'Ganga Knowledge Centre (GKC) had been prepared by the NMCG in-house and under process for submission before the Empowered Steering Committee of the NGRBA for approval. Moreover, Public participation through strategic and broad-based communications and community participation components had been emphasized. The aim was to build, support, manage expectations and sustain public pressures to complement regulatory enforcement and investment outcomes. City level Monitoring Committees (CMCs) headed by the District Magistrate and Collector concerned were being formed for every project towns to achieve such goals.

9.92. On a pointed query as to whether it give a promising hope that the Mission Clean Ganga as envisaged to be achieved by 2020 would be

accomplished the MoEF stated that they were trying their best to achieve the NGRBA's objectives. However, full cooperation and efforts of State Governments were required to achieve the objective of 'no untreated industrial effluent or domestic waste water going into River Ganga by the year, 2020'.

9.93. On categorically been asked to highlight concrete convincing plans of action through which the Authority seeks to accomplish their Mission, the MoEF submitted in their written reply that an 8 (eight) years perspective, considering scope of infrastructure investments for abatement of pollution of river Ganga had been drawn up estimated to cost about ₹ 26,000 crores. The Cabinet Committee or Economic Affairs (CCEA) had already approved World Bank assisted NGRBA Project for ₹ 7000 crores for implementation over a period of 8 years. In addition, funds from the Government's own resources were also made available through budgetary allocation for all the on-going NGRBA projects. The total outlay for Annual Plan 2012-13 for ₹ 512.5 crores had been approved.

9.94. On being asked to furnish the updated details of expenditure incurred under the NGRBA programmes for abatement and control of water pollution of river Ganga since the inception of the NGRBA, the following data was furnished by the MoEF :

Table 9.94 : Details of Expenditure incurred under NGRBA Programmes

(Amounts are in crores of rupees)

Year	Amount allocated		Expenditure incurred under NGRBA
	Budget Estimates	Revised Estimates	
2010-11	500.00	500.00	499.77
2011-12	500.00	216.61	192.64
2012-13	512.00	193.50	191.62
2013-14 (up to December 2013)	355.00	309.11	294.03

As of December, 2013, the total expenditure incurred under NGRBA Programmes since its inception stands at ₹ 1178.06 crores.

9.95. On being asked to state as to how planning for control of pollution by National Ganga River Basin Authority (NGRBA) was any different from the process followed right now for other rivers; the MoEF stated that under the National Ganga River Basin Authority (NGRBA) the basin had been considered as a whole for planning the pollution control activities whereas in the existing system town was considered as a unit for planning the pollution control activities. Under NGRBA, PPP model was being considered for funding of sewerage schemes whereas under National River Conservation Plan (NRCP), State Implementing Agencies were assigned the job of executing the sewerage projects. The new guidelines had been prepared for the preparation of detailed project report which entailed preparation of City Sanitation Plan, preparation of feasibility report for identification of suitable option of technology for sewerage scheme and prioritization of schemes proposed for funding by the State Government. In addition to above, the water quality monitoring under the NGRBA programme had been planned for 'automatic real time monitoring' system in the main-stem of river Ganga wherein data generated in 15 minutes interval were proposed for quality control monitoring on regular basis whereas rest of the rivers in the Country, the water quality system was being mostly manually monitored.

9.96. On the frequency have meetings of Chief Ministers of Ganga Basin rivers taken the MoEF submitted that the State Ganga River Conservation Authority (SGRCA) / State River Conservation Authority (SRCA) headed by the Chief Ministers of the Ganga Basin Slates of Uttar Pradesh & West Bengal met twice while Bihar SGRCA met once since setting up such authorities in 2009 and 2010. There was no meeting of SGRCA under the Chairmanship of the Chief Ministers held in the basin State of Uttarakhand and Jharkhand so far.

9.97. On the issue of whether any plan of action, cutting across Ministries, have been drawn up, the MoEF stated that the inter-Ministerial Group constituted on 15/6/2012 by the NGRBA has met thrice on 26th July, 14th August and 5th September, 2012 to consider basic issues regarding environmental flows. Further, the Basin Management Plan being prepared by the IIT Consortium will highlight inter-ministerial issues for preparing a plan cutting across the Ministries. New projects were being now sanctioned based on a coordinated action for each municipal town with the appraisal of the Empowered Steering Committee, which had representation from the Ministry of Urban Development, Ministry of Water Resources, Planning Commission etc.

9.98. On being asked as to whether the Ministry proposes to establish long-term vision for other river basins in the country, the MoEF in their written reply stated that the need for a river basin approach for conservation was already recognized by the Central Government. The Government therefore, constituted a 'National Ganga River Basin Authority' (NGRBA) as an empowered planning, financing, monitoring and coordinating authority for the Ganga River with new institutional structures. The objective was to have the river basin as the unit of planning, a shift from town centric to river basin approach and to have a comprehensive response covering water quality and flow, sustainable access, environment management, prevention and control of pollution in the form of a national mission. A holistic approach in preparing pollution abatement projects was now being adopted for River Ganga. A comprehensive basin management plan was being prepared by a consortium of seven IITs. Instead of standalone STPs, I&D etc., an integrated approach including sewer network was being adopted.Slums and individual houses having no space for household installation of toilets shall also be covered through community toilets. The new approach will ensure full coverage of the city and thereby transportation of entire sewage to STPs for optimal treatment and utilization. Based on the experience of implementation, this river basin approach will also be adopted for the other rivers in the country. However, this will also depend on provision of the

commensurate level of budgetary resources. The MoEF had circulated revised guidelines for the preparation of DPR in December, 2010. The interception and diversion scheme for sewage collection and treatment had been modified to cover laying of sewers in whole city and dovetailing of schemes sanctioned under JNNUNRM of MoUD etc. The MoEF continue to monitor water quality through CPCB. However, creation of sewerage network, setting up of STPs etc. involved collective and cooperative efforts involving various central and State agencies which are key stakeholders in the process. It was further stated that the experience of Ganga was proposed to be utilized for conservation of all other rivers in the Country.

CHAPTER X

IMPLEMENTATION OF PROGRAMMES FOR CONTROL OF POLLUTION OF RIVERS, LAKES AND GROUND WATER

I. NATIONAL RIVER CONSERVATION PLAN

10.1 Audit Report pointed out that at the Centre, with respect to programmes for source protection, treatment and restoration of rivers, the National River Conservation Plan (NRCP) was implemented since December 1996 as an extension of the GAP Phase-I to other rivers of the Country, under which works taken up include viz. Interception and Diversion works : To capture the raw sewage flowing into the rivers through open drains and divert them for treatment; Sewage Treatment plants : For treating the diverted sewage; Low Cost Sanitation works : to prevent open defecation on riverbanks; Electric Crematoria : To conserve the use of wood and help in ensuring proper cremation of bodies brought to the burning ghats; River Front Development Works : Improvement of bathing ghats; Public awareness : Through media and other outreach programmes ; Human Resources Development : Capacity building, training and research in the area of river conservation; Prevention of pollution from point sources : Sewerage and sewage treatment for the entire lake's catchment area; In-situ measures of lake cleaning : Desilting, deweeding, bio remediation-aeration, biomanipulation, nutrient reduction, constructed wetland approach; Catchment area treatment : Afforestation, storm water drainage, silt traps etc.; Lake front eco-development : Strengthening of bund, lake fencing, shoreline development etc.; Public awareness : Outreach programmes with citizens of different age groups and Human Resources Development : Capacity building, training and research in the area of lake conservation.

10.2 Audit further pointed out that the process of inclusion of rivers into NRCP is initiated by the CPCB with identification of polluted river stretches, which are sent to the States. The States thereupon either prepare Detailed Project Reports (DPRs) for projects such as I&D, STP, LCS for control of pollution of river stretches

identified as polluted by CPCB and send them to NRCD or alternately States send DPRs for rivers not in CPCB list but found polluted by the State as per NRCD criteria. Finally, NRCD approves DPR or send it back to States for revision.

10.3 Audit findings also pointed out that at the Centre assessment of pollution of rivers from different sources was not comprehensive and although CPCB has created in list of the sources of pollution, MoEF has not created programmes to prevent effluents entering the rivers. NRCD projects deal only with stretches where pollution has already occurred. Further, NRCP focussed on sewage and crematoria as the sources of pollution of rivers and other kinds of pollution like industrial pollution were not considered which had an equal, if not, adverse effect on health and environment. Audit further pointed out that in the States, dismal implementation of NRCP programmes reveals itself with only 4 states conducting survey to quantify pollution caused by sewage to all the rivers by all the towns/cities on banks of rivers flowing in State; only 2 States making some attempts to quantify pollution caused by industries and agricultural run-off flowing into its rivers; only 8 States had sent list of polluted rivers in the State, based on assessment of amount of pollution to MoEF for industries under NRCP; and of the 20 States in which rivers have been included in NRCP, the State Governments in only 8 States have planned to address the complete reduction of pollution of the river.

10.4 Audit further pointed out that inclusion of rivers under NRCP was not based on their pollution levels and while polluted river were not selected under NRCP, others which were less polluted were observed to have been selected for pollution control. Moreover, the State wise selection of rivers in NRCP was asymmetrical. Audit findings further observed instances where polluted rivers were not selected under NRCP and others, which were less polluted, selected for pollution control. The State-wise selection of rivers in NRCP was asymmetrical. For example, 69 projects for Madhya Pradesh and 83 for Tamil Nadu were approved under NRCP. By comparison, only 69 were approved for Maharashtra, Gujarat and

Andhra Pradesh put together, despite the fact that the latter group had more number of polluted rivers.

10.5 Inadequacies in the performance of projects undertaken under NRCP reveals itself in the absence of technical evaluation of DPRs with DPRs being appraised in house by MoEF and not sent to a specialist task force/panel of scientists from reputed Institute for evaluation which would have ensured expert feed back. Moreover, no timeline was fixed for preparation and submission of DPRs by the states to MoEF and for approval of DPRs by MoEF. Secondly, inadequacies in the performance of sewage Treatment Plants (STPs), which were the primary focus of projects selected under NRCD with inadequate capacity utilization, neglected sludge handing facilities with most of them out of order, unquantified staff for O&M of STPs which were contracted out resulting in a huge gap between total generation of sewage and treated sewage. CPCB had evaluated the performance of 84 of the 175 STPs built under NRCP in 2007. According to this evaluation, the performance of 46 STPs was poor or very poor, eight were rated good, while the performance of the balance 30 was satisfactory.

10.6 Audit findings further pointed out that at the level of the States, implementation of the projects was very unsatisfactory. Projects were delayed beyond the scheduled completion dates and many of them were not completed despite a lapse of five years after they were sanctioned. Audit further pointed at that out of the completed projects, 82 per cent of the projects under NRCP were completed after the scheduled date of completion and 28 projects costing ₹ 251.27 crore were constructed but not utilized. States implementing the projects faced problems in land acquisition, getting requisite permissions, especially forest clearances, technical problems, problems from contractors etc. Implementation was especially poor in States like Andhra Pradesh, Bihar, Jharkhand, Haryana, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Sikkim, Uttar Pradesh and West Bengal. The extent of delays in implementation of projects as pointed out by audit revealed delays of more than 5 years and above in as many

as 17 projects under NRCD; delays of 3-5 years in 26 projects; delays of 2-3 years in 6 projects; delays of 1-2 years in 11 projects; and delay of 1 month-1 year in 26 projects.

INORDINATE DELAY IN IMPLEMENTATION OF NRCD PROJECTS

10.7 Audit test checked 140 projects across 19 States and 41 towns situated on banks of 24 rivers for detailed scrutiny. Table 10, page 42 of Audit Report reveals the extent of delay in completion of projects goes upto 5 years and above in the case of 17 such projects pertaining to water pollution. The extent of delay for more than 5 years in many such projects indicates poor level of monitoring of these projects. The Committee sought to know whether the Ministry consolidated an umbrella agency for better coordination and accountability in implementation of these projects. The MoEF, thereupon submitted that the Ministry had not constituted an umbrella agency but taken several steps to prevent delay in execution of project such as signing of Tripartite Memorandum of Agreement (MoA) after sanction of the project with the State Government and the implementing agency through which the fund was routed, inter-alia, incorporating the expected outcomes from the project, proposed components and the time line to reduce delay in execution of project; ensurance of Land acquisition before releasing the funds for the scheme to prevent delay; submission of the physical and financial progress reports of the project was by the implementing agency on a monthly basis in the prescribed format at National River Conservation Directorate (NRCD), MoEF. The Utilization Certificates in respect of the funds utilized for expenditure on the project and the unspent amount at the end of the period was submitted by the implementing agency on a quarterly basis; for review of implementation of the NRCP projects; constitution of a Steering Committee under the chairmanship of Secretary (Environment & Forests). The officers of the NRCD, MoEF visit the project sites on regular basis for monitoring and review of progress of implementation of the projects under the NRCP. Review meetings were also held by the senior officers of MoEF with the State Government officials from time to time.

10.8 NLCP as a programme has been ineffective in achieving the objective of conservation and restoration of lakes in India. Only two of the test checked 22 projects had been completed and the rest were either continuing beyond the sanctioned date of completion or had been abandoned. Problems like resistance from locals over proposed construction of STPs etc., dispute over site, inability to arrest sewage flow, non-availability of land etc., have contributed to non-completion of the projects. As a result, water quality parameters of only three lakes namely Sharanabasaveshwara, Nainital lake and Kotekere lake has been restored to the designated criteria, while these parameters in respect of other lakes like Banjara, Dal, Bellandur, Veli Akkulam, Shivpuri, Powai, Rankala, Mansagar, Pichola, Pushkar, Kodaikanal, Twin Lakes, Bindusagar, Durgabari , Dimsagar and Laxminarayanbari, Mansi Gang and Rabindra Sarovar could not be restored to the designated criteria. Bio-conservation zones have not been notified around the lake to prevent encroachment of lake shoreline. As such, audit concluded that programmes to control pollution of rivers and lakes in India have not been implemented adequately.

10.9 On being asked whether MoEF propose to add industrial pollution etc. in the projects sanctioned under NRCP, MoEF replied that since CPCB, a scientific organization has already been created under the Water (Prevention and Control of Pollution) Act, 1974 to deal with the industrial pollution, no such proposal was currently under consideration of the Ministry for inclusion of projects for industrial pollution control under NRCP.

10.10 The Committee sought to know whether the Ministry had reviewed the existing system of selection of projects in the light of the observation made by Audit, the MoEF thereupon replied that the projects for abatement of pollution of river have been selected by NRCD on the basis of quality of river water of the river stretch. The project proposals submitted by the State Governments contain information on details of waste water generated in the town/city, the extent of treatment capacity available and details of industrial pollution. The projects are appraised by

independent appraisal institutions. In this regard, detailed guidelines for the preparation of DPRs under NRCP hitherto followed have now been revised. Under the revised guidelines, preparation of Detailed Project Report for pollution abatement works of sewerage schemes is a three step process, namely, preparation of City Sanitation Plan (CSP), Feasibility Report (FR) followed by the Detailed Project Report (DPR). CSP should be prepared on the basis of available data (Primary / Secondary Data) that has been generated by the concerned agencies. Feasibility Report will identify the problem of pollution, develop and evaluate the various options and select the best that is cost effective and sustainable and produces the intended outcome. The DPRs of non-sewerage schemes can be prepared straight after the preparation of CSP. For preparing the DPR, additional data may be generated by undertaking suitable survey and investigation.

10.11 The Committee also sought to know what action has been taken/ proposed by MoEF to ensure that State-wise selection of projects under NRCP was more representative, the MoEF in their written reply submitted that the Ministry was supplementing the works of State Governments in implementing the programme for abatement of pollution in various river stretches under the National River Conservation Plan and the funding of such projects presently was in the ratio of 70:30 in the stretches identified by CPCB. The selection of projects depend on the proposals to be received from State Government, availability of funds, commitment from implementing agency (State Government) to contribute 30% of the cost etc. Further, MoEF has revised guidelines for the preparation of DPR which takes care of collection of all relevant data required for the pollution abatement schemes and to address all issues that may impede project implementation. The project proposals submitted by State Governments were being examined by the NRCD Scientists. However, presently the projects were being appraised by independent appraisal institutions. After getting the appraisal report, the projects were being taken for approval before the competent authority. After approval of the project, implementation of the project including tendering, execution of works etc was done

by the State Implementing Agency. Cost and time overruns in projects were due to a variety of reasons which include lack of inter-agency coordination at field level, delays in acquisition of land for STPs & Pumping stations, contractual problems, Court cases, etc. While issuing sanctions to the projects, a condition was made that cost overrun, if any, will be borne by the State Governments/ ULBs concerned.

10.12 The Ministry also furnished out the salient Features of the revised Guidelines as under:

i. City Sanitation Plan (CSP) shall be the basis for planning and formulating projects. Therefore, preparation of city sanitation plans, wherever it doesn't exist, will be the first step. However, CSP shall be prepared on the basis of City Development Plan (CDP), if so drawn and finalized for the city.

ii. Holistic approach and provision of integrated sewer network up to house-property line in place of drain interception and diversion. This will ensure full coverage of the town and thereby transportation of entire sewage to treatment plants for optimal utilization.

iii. Dovetailing with projects under JNNURM/UIDSSMT/ State Plan is compulsory. This will ensure optimal utilization of resources on priority basis.

iv. Design, Build & Operate (DBO) model for efficient operation and maintenance (O & M) of River Conservation schemes.

v. Signing of tripartite MoA among Government of India, State Government and ULB is mandatory. This will bind these three tiers of Government to ensure fulfillment of respective commitments in terms of release of funds, timely completion of projects, ensuring house connection to sewer and operation & maintenance of assets, etc.

vi. Dedicated Cell in States for implementation of projects. This will ensure fulltime deployment of adequate number of skilled technical personnel by the States which is critical for proper supervision, quality control, adherence to completion schedule and project cost control.

vii. Appraisal of project proposals by independent Institution/Experts. This will enhance quality of DPR in addition to cost optimization. Any short comings in the planning and designing of the project will also be addressed through such appraisal.

viii. Third Party Inspection (TPI) for implementation of projects is required. This will strengthen State Government agencies in maintaining the desired quality of work. Generally, States are not in a position to deploy adequate technical personnel for round the clock supervision of works and hence this will be an effective mechanism to ensure progress and quality of works.

ix. Emphasis on recycling and reuse of treated sewage. Agricultural and industrial demand on fresh water is very high. On the other hand, drawing of fresh water from rivers for these purposes may also contribute to pollution as dilution reduces. Therefore, there should be an endeavor to maximize the use of treated sewage.

x. Degree of treatment linked to availability of fresh water in river. Instead of uniform level of treatment, the approach of varying level to be followed as water quality is directly linked with availability of fresh water in a particular stretch of river.

xi. Adoption of innovative and best technology options for treatment of sewage. Technology selection is critical to technical and financial sustainability of assets created. Detailed and careful exercise may be undertaken for selection of the best option on a case to case basis. For this, life cycle study of technology options along with detailed analysis in respect of performance will be mandatory at FR stage.

xii. DPR preparation to be preceded by Feasibility Report (FR). This will focus on option exploration and selection of locations for major infrastructure. This will also help reduce uncertainty in land acquisition and pre-emptively resolve other local issues, thus contributing to timely execution of project.

It was also submitted that some of the State Governments have not submited any proposals.

10.13 The Road Map further added the following parameters to the revised guidelines :

i. First 5 years O & M cost to be in-built in the project cost. This will ensure unhindered O & M of assets which is necessary for achieving the river cleaning objectives. Next 10 years O & M cost to be also worked out with revenue generation plan. The O & M responsibility beyond 5th year will rest with the State Government/ ULB.

ii. Stakeholder consultation at the stage of formulation and implementation of the project. This is to ensure active involvement of various stakeholders and the civil society to generate support and encourage ownership.

iii. Use of digital maps, other 'information - communication technology' (ICT) tools and software for project planning and design. In order to improve scientific and engineering design and planning, good quality maps and computer aided design are necessary.

iv. Coverage of schemes for management of Municipal Solid Waste affecting river water quality. Different types of solids and solid waste also contribute to river pollution significantly. Therefore, this activity will be taken up selectively under the program.

v. Priority to undertake River Conservation Projects for City/ Towns polluting river stretches identified by CPCB. The list of polluted stretches published by CPCB from time to time will primarily be the basis for selecting rivers and towns to be included under the program.

vi. Adoption of innovative and best technology options for treatment of sewage. Technology selection is critical to technical and financial sustainability of assets created. Detailed and careful exercise may be undertaken for selection of the best option on a case to case basis. For this, life cycle study of technology options along with detailed analysis in respect of performance will be mandatory at FR stage.

vii. DPR preparation to be preceded by Feasibility Report (FR). This will focus on option exploration and selection of locations for major infrastructure. This will also help reduce uncertainty in land acquisition and pre-emptively resolve other local issues, thus contributing to timely execution of project.

viii. In addition, the following good practices will be promoted under the revised guidelines:

ix. Incorporation of Rain water harvesting in community sanitation schemes.

x. Promotion of solar energy for community sanitation schemes.

xi. Improved sanitation scheme based on higher user charges where applicable.

xii. Up gradation of existing community sanitation and sewerageinfrastructure.

xiii. Thrust on innovative River Front Development (RFD) Projects.

xiv. Introduction of "river festival" and "river runs" under the public participation, Information, Education & Communication (IEC) activities.

xv. Design parameters of STP to be considered based on actual measurement and analysis.

10.14 The CPCB Report pointed out that capacity utilisation was inadequate. It also stated that sludge removal was the most neglected area with most of the sludge handling facilities being out of order. The Report observed that the task of operating the STPs was given to contractors who were deputing unqualified staff for the task, which was a factor in the poor performance of the STPs. With regard to performance of projects undertaken under NRCP, it was observed that the performance of sewage treatment plants was extremely poor with the national capital treating only 62 percent of the sewage generated, Bangalore only a miniscule 10 percent and in Hyderabad, 43 percent. Only Ahmedabad has the capacity to treat the entire quantity of sewage generated in the city. The Committee sought the views of the Ministry in this regard. The Ministry thereupon stated that they are only supplementing the efforts of the State Governments in providing adequate sewerage facilities in towns and cities in the State. To ensure that the

assets created are operated and maintained properly, a tripartite agreement was entered into with the local bodies, State Government and the NRCD. Besides the project cost, five years O & M cost is also in-built in the project cost for proper operation and maintenance of the assets created. A separate clause was also included in the tender document stating that the project executing agency would operate and maintain the assets created. The Ministry had been regularly reviewing the O & M of assets created so that desired results are achieved for conservation of rivers.

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

10.16 While it was an undisputed fact that the responsibility for creating infrastructure for collection, treatment and disposal of sewage rests with the States, as per Section 16(2)(f) of the Water (Prevention and Control of Pollution) Act, 1974, it was the responsibility of CPCB to collect, compile and publish data relating to water pollution and devise measures for its effective prevention and control. Further, there was no comprehensive database on the pollution load entering water bodies across the country. Also, data on sewage generation published by CPCB in December 2009 pertains only to Class I and II towns while the rural hinterland remains unrepresented. Similarly, the data on Common Effluent Treatment Plant (CETP) pertains to 78 CETPs relating to the period 2002-2005.

II. NATIONAL LAKE CONSERVATION PLAN (NLCP)

10.17 Audit Report pointed that the NLCP implemented since 2001 for the conservation and management of polluted and degraded lakes in urban and semi-urban areas of the Country where degradation was primarily on account of discharge of waste water into lakes. Activities covered under NLCP include *inter alia* Prevention of pollution from point sources : Sewerage and sewage treatment

for the entire lake's catchment area; In-situ measures of lake cleaning : Desilting, deweeding, bio remediation-aeration, bio-manipulation, nutrient reduction, constructed wetland approach; Catchment area treatment : Afforestation, storm water drainage, silt traps, etc; Lake front eco-development : Strengthening of bund, lake fencing, shoreline development etc; Public awareness : Outreach programmes with citizens of different age groups; Human Resources Development : Capacity building, training and research in the area of lake conservation.

10.18 The process of inclusion of lakes under NLCP is initiated by CPCB on identification of polluted lakes after which, list of polluted lakes are sent to the States. The States either prepare DPRs for projects to control pollution of the identified lakes to NRCD or alternatively the States send DPRs for lakes not included in CPCB list but found polluted by the State as per the NRCD criteria. Finally NRCD approves or sends it back to States for review.

10.19 Audit scrutiny further revealed that quantification of pollution of all the lakes in terms of sewage, small/medium/large industries, distilleries, mines, tanneries, paper and pulp industries, sugar factories, agricultural runoff, pesticides/insecticides was not done by MoEF/CPCB, in the absence of which target to deduce pollution caused by these sources would be rendered disabled. As regards, the process of inclusion of lakes under NLCP, audit findings revealed that the consolidated priority list furnished by MoEF to audit in respect of all the States/UTs revealed that only 12 States/UTs had prioritized their lakes which indicated the low priority attached by the States to this vital activity.

10.20 Enquired about the action taken/ proposed by MoEF to ensure that all States/UTs submit their priority list to MoEF in time, the MoEF stated that the Ministry was implementing the scheme of National Lake Conservation Plan (NLCP) since June, 2001 for conservation and management of polluted and degraded lakes in urban and semi-urban areas of the Country where degradation was primarily on account of discharge of waste water into the lake, through an integrated ecosystem approach. The components/activities covered under NLCP were aimed at achieving

treatment/rejuvenation of polluted/degraded lakes. In order to identify polluted and degraded lakes across the Country, a study was carried out by the Ministry in November, 2003 at the instance of Planning Commission. A list of 62 lakes across the Country requiring conservation was prepared under the study. The State Governments were asked to review this list and to prioritize the lakes in their States for submission of proposals under NLCP. Proposals for lakes conservation were considered for sanction subject to their admissibility as per NLCP guidelines, pollution status, prioritization and availability of funds under the Plan. Some States namely Chhattisgarh, Himachal Pradesh, Bihar, Manipur, Assam, etc, had furnished priority list but either not submitted any proposal for consideration under NLCP or the same did not meet NLCP guidelines. States namely Jammu and Kashmir, Kerala, Uttaranchal, West Bengal, Tripura and Nagaland has sent one proposal each. These were examined and approved by the competent authority for funding under NLCP. The Ministry had subsequently revised and published NLCP Guidelines in May, 2008, in consultation with the experts, State Governments/LDAs/concerned IAs and other stakeholders. It was stated that the States have since been proactive and more concerned about the lake conservation in their jurisdiction.

10.21 The Committee were informed that proposals for consideration under NLCP from some States did not meet the requirement to the guidelines. In such a situation, the Ministry was asked about the follow up action. The MoEF submitted in their written reply that the Ministry was implementing the Centrally Sponsored Scheme of National Lake Conservation Plan (NLCP) for conservation and management of polluted and degraded lakes in urban and semi-urban areas of the country, on 70:30 funding pattern through an integrated ecosystem approach. Guidelines for implementation of National Lake Conservation Plan (NLCP) scheme were published in April, 2008, and are available in public domain at Ministry's website www.envfor.nic.in. That broadly contains objectives, activities covered, selection criteria, administrative requirements, etc. Proposals for lake conservation are considered for sanction subject to their admissibility as per National Lake

Conservation Plan (NLCP) guidelines, pollution status, prioritization and availability of funds under the Plan. The State Governments were required to identify and prioritize water bodies in the State, based on different criteria contained in the guidelines. The proposals received from the State Governments were first examined inhouse for their admissibility. If not meeting the guidelines, the proposals were referred back to the State Governments for necessary clarifications/revisions. In the process of examination of proposals, restructuring/modifications were also suggested based on the site visits undertaken. It was further submitted that the Ministry had also recently introduced the provisions of examination/ evaluation of the DPRs through an independent consulting institute, whose comments are also sought on the proposals received from the States.

10.22 On a specific query as to whether the Ministry considered including the lakes facing encroachment and resultant filling up in the scope of the NLCP and also whether the States were being encouraged to declare bio-conservation zones around the lakes to prevent encroachment of the shoreline, the MoEF stated that the Ministry under their ongoing scheme of NLCP, had published guidelines for NLCP in June 2008. As per these Guidelines, the administrative requirements for addressing the encroachment issues were as under:

(a) The State Government/local Administration is to take necessary steps for declaring the lake boundary through a Government Order. The lake boundary is to be decided in relation to the lake submergence area at its full tank level.

(b) The local administration/ local body is to take all necessary steps to ensure removal of encroachments if any in the lake submergence area/lake boundary. A commitment to this effect is to be furnished by the concerned State authorities for consideration of the proposal.

(c) The project proponents to consider for notifying the ‘Establishment of a Bio-conservation Zone’ around the water body for better safeguard of the

lake surroundings from the growing pollution potential and the encroachments.

10.23 Audit pointed out that inclusion of rivers and lakes into NRCP and NLCP was therefore, flawed as MoEF/CPCB/ States did not conduct a comprehensive survey to assess pollution levels in rivers/lakes all across the Country. The total amount of pollutants being discharged into all the rivers of India from sources like industries, mining, tanneries, distilleries, etc., was also not worked out before initiation of NRCP/NLCP. Selection of rivers/lakes under NRCP/NLCP was not based on pollution level of the river/lake and NRCP/NLCP was not planned by MoEF to address the reduction of entire pollution of selected rivers and lakes.

10.24 As regards the performance of projects undertaken under NLCP, inadequate inspection of projects by the MoEF left them totally unaware of the difficulties faced during implementation. They also lost opportunity to make mid-course corrections with most projects being monitored only once during the implementation period. Audit also pointed to delays in implementation of projects with delay of more than 5 years observed in projects carried out in 4 lakes; delay of 3-5 years in 10 lakes; delay of 2-3 years in 1 lake; delay of 1-2 years in 2 lakes and delay of one month – 1 year in 2 lakes.

10.25 The implementation aspects pertaining to the National Lake Conservation Plan (NLCP) as enumerated in the Road Map of MoEF is brought out in **Annexure – I** to this Report.

10.26 On the issue of review of existing system of selection of projects for abatement of pollution of river, the Committee have been informed that under the revised guidelines preparation of Detailed Project Report for pollution abatement works of sewerage schemes is a three step process, namely, preparation of City Sanitation Plan (CSP), Feasibility Report (FR) followed by the Detailed Project Report (DPR). CSP should be prepared on the basis of available data (Primary / Secondary Data) that has been generated by the concerned agencies. Feasibility

Report will identify the problem of pollution, develop and evaluate the various options and select the best that is cost effective and sustainable and produces the intended outcome. The DPRs of non-sewerage schemes can be prepared straight after the preparation of CSP. For preparing the DPR, additional data may be generated by undertaking suitable survey and investigation. In this context, the Committee sought to know whether these available data that has been generated by concerned agencies and used as inputs for preparation of City Sanitation Plan (CSP) were found to be reliable, realistic and based on the actual ground level testing the MoEF replied that the City Sanitation Plan was prepared with the help of local level data either available with the local district level authority or generated by carrying out monitoring in the project area. The population data, water consumption data and sewage flow data were available with the implementing agency. However, sewage quality data, levels of surface (with respect to Mean Sea Level-) and gradient data etc were to be generated by actual field monitoring. The data generated by implementing agency were reliable as long as they are obtained by carrying out field studies. However, data collected from other agencies could be verified by viewing the records.

10.27 On being asked as to how do the MoEF ensure the reliability of such data, the Ministry stated that the State level agencies maintain block and ward wise data for population and update at regular intervals as per existing rules. However, water supply data was maintained by the public health engineering department or water supply boards etc. Generally 80% of water consumption was taken as sewage generated. Additionally, ground water consumption was worked out on the basis of number of such wells and water yield from them. This was done by Central Ground Water Authority. As such, impact of quality of data was seen only after completion of scheme.

10.28 On the query as to how these data were collected, the MoEF stated that the State level agencies maintain block and ward wise data for population and update at regular intervals as per existing rules. However, water supply data was

maintained by the public health engineering department or water supply boards, etc. Generally, 80% of water consumption was taken as sewage generated. Additionally, ground water consumption was worked out on the basis of number of such wells and water yield from them. This was done by Central Ground Water Authority.

10.29 On being asked as to whether there was any stipulated procedure for collection of primary and secondary data the MoEF replied that there was a standard procedure for collection of all primary and secondary data, the institutions delegated the authority under the existing local rules and regulations follow standard procedure for collection of primary data like population, water consumption etc. However, the secondary data was generated by the project implementing agency by actually monitoring at project site by following standard procedure like sewage flow, pollution load and sewage characteristics etc.

10.30 The Committee further sought to know how the evaluation of various options was done for preparation of Feasibility Report, the MoEF thereupon replied that the evaluation of various options was done for preparation of Feasibility Report on the basis of field data or performance data already available with the project implementing agency for various functional treatment technologies and the technologies suggested by the National River Conservation Directorate.

10.31 On a specific query as to the type of parameters that are chosen for the cost effective and sustainable options for producing the intended outcome, the Ministry replied that considering the cost effective and sustainable technology selected, cost of Operation and maintenance, skilled/ unskilled manpower required, power consumption, land required, flexibility of technology for upgradation etc were the parameters on the basis of which final selection of technology was done.

10.32 On being asked as to whether additional data were actually collected after undertaking suitable survey and investigation, the MoEF replied that Sewerage projects and detailed project reports (DPRs) thereof may be prepared after finalizing

the land for setting up infrastructure such as sewage treatment plants and pumping stations, to avoid delays in project implementation. However, additional data like soil characteristics like porosity, pH, bearing capacity; ground water table, proximity to population centres etc. were examined.

10.33 The Committee have further been informed that as per the revised guidelines, projects under NRCP are being appraised by Independent Appraisal Institutions. After getting the appraisal report, the projects are being taken for approval before the competent authority. After approval of the project, implementation of the project including tendering, execution of works etc., is done by the State Implementing Agency. Cost and time overruns in projects are due to a variety of reasons which include; lack of inter-agency coordination at field level, delays in acquisition of land for STPs & Pumping stations, contractual problems, court cases, etc. In this context, the Committee specifically queried as to how the Ministry plan to improve upon the various reasons identified for cost and time overrun of these projects; the MoEF stated that the new guidelines prepared in December 2010 will help further reduce time and cost overrun which will be reviewed when such cases come up for approval.

10.34 The Committee sought the details as to whether revised guidelines stipulate third party inspection for implementation of projects and if so, whether in actual practice such third party inspections are carried out, the MoEF thereupon replied that:

"NRCD has decided to carry out the impact evaluation of the NRCP and NLCP projects in the country. The Country was divided into 3 regions namely Region – I, Region – II, Region – III. M/s SMEC India Pvt Limited had been engaged to conduct studies for region – II and M/s Wilbersmith Associates Pvt Ltd. were engaged to conduct studies for Region –I and Region – III."

A. REGION II BY M/S SMEC INDIA PVT LIMITED:

Region – II (East and Central India) consists of States of Bihar (Ganga-Patna), Jharkhand (Suwarnarekha-Jamshedpur), Madhya Pradesh (Khan-Indore and Kshipra-Ujjain), Orissa (Mahanadi-Cuttak and Coatal area-Jagannath Puri) and West Bengal (Ganga- Badreshwar, Champadani & Maheshtala and Lake Mirik – Darjeeling). Site visits for Region -II were made during the period February to June 2010 and supplementary visits were undertaken in March-April 2011.

It has been reported in the Interim Report that apart from Interception & Diversion works followed by Sewage Treatment Plants, which constituted major part, other projects carried out in this region under NRCP were Low Cost Sanitation (LCS), Electric/Improved Crematoria (EC), River Front Developments (RFD) as well as construction of Washermen's' Platform, Afforestation and Solid Waste Disposal. Apart from these, Public Awareness Campaigns formed an important activity.

For evaluation purposes, the activities were divided into 3 phases i) Planning (pre-construction), ii) Construction and iii) post construction. Evaluation of each phase was followed by appropriate recommendations.

During evaluation it was found that most of the projects were completed within the given time frame or within a reasonable time beyond it. However in certain cases e.g. laying of drainage system in Jagannathpuri was hampered due to high groundwater table and STP at Champadani could not be commissioned due public agitation following a mishap at the site. Apart from this several facilities, especially Electric Crematoria were found not working satisfactorily for various reasons elaborated in the Interim Report.

While specific recommendations, like repairs of structures, providing water/electric facilities, repairs of equipments etc are given in the report, some of the general recommendations made in the Interim Report are as follows:

- It has been noticed that DPRs lack in several details, it should be discussed with various stake holders before finalization.

- Substantial numbers of houses are not connected to sewerage system due to reluctance of owners. It is recommended that in all the areas covered by sewerage schemes, it should be mandatory for house owners to connect the houses to the facility.

- I&D works should not be regarded as permanent solution. These are only temporary measures to take care of wastewater collection, treatment and disposal system till the sewerage network up to house-property line and STPs are constructed.

- The DPRs prepared were not of desired quality. It is therefore recommended that the project proposals should be appraised by independent Institution/Experts.

- There has been no instance where treated effluent is being put to any recycle/reuse. Treated wastewater can be a valuable resource if put to proper reuse

- Waste Stabilization Ponds (WSPs) are good alternative for small towns. For large towns, area required is very large and causes several O&M problems.

- For O&M of sewerage and STPs, ULBs are still dependent on State departments like PHED for technical knowhow as well as financial assistance. ULBs in a State should develop their own trained manpower.

- In low cost sanitation schemes there was a common complaint about limited water availability as well as lack of power supply.

- States should set a special agency (dedicated Cell), which shall look after all the urban restructuring projects under financial assistance from Central/State Governments. This agency shall oversee that local bodies follow the

guidelines in preparing DPR. The agency shall then carry out tendering process and award of the works.

- Build, Operate and Transfer (BOT) model may be followed to ensure efficient operation and maintenance of River Conservation schemes.

B. **REGION I & III BY M/S WILBER SMITH ASSOCIATES PVT LTD:**

As part of the consultancy assignment for Evaluation of Schemes Implemented Under NRCP & NLCP, schemes implemented in 11 towns in 5 States falling in Region I comprising of Delhi, Haryana, Panjab, Uttarpradesh and Uttarakhand and 10 towns in 6 States falling in Region III comprising Gujarat, Maharashtra, Goa, Andhra Pradesh, Karnataka and Tamilnadu were evaluated by M/S Wilbur Smith Associates Private Limited. The analysis and findings of the study are summarized below.

i. The requirement of a technical arm for scrutiny & approval and evaluation & monitoring together with regional presence of the organization are strongly felt.

ii. The program consisted of main components such as Interception& Diversion, Sewage Treatment Plants, Improved Crematoria, River Front Development and Low Cost Sanitation. Onsite inspection of the executed components revealed that most of the completed components were working satisfactorily. In some isolated cases it was observed that Interception and Diversion works proved inadequate owing to design and operational defects. Similarly, providing crematoria have not helped much in achieving its intended objective. Low cost sanitation systems were successful only where there existed a proper O&M mechanism involving a dedicated operator. Sewage Treatment Plants, the heart of the program, was largely successful. However, selection of appropriate technology for treatment of sewage would

give better results. There should be matrix based criteria for selecting technology for STP.

iii. The NRCP program, as of now, is town based but it needs to be extended to whole river basin so that total pollution load generated in the basin can also be tackled for river conservation.

a. The procurement process under the program needs to be streamlined. At present there is no standard procurement practice established for the program. It is suggested to develop standard procurement documents and mandatory procurement guidelines specific to the program.

iv. O&M of created assets is the weakest link in the program. Involvement of the Local Body and creation of a revolving fund at national level are suggested to improve the scenario.

v. Steps are needed to protect and maintain the river stretches already cleaned under the programme. Increased involvement of the State Pollution Control Boards with special penal provisions within the existing regulatory frame work are suggested towards this.

vi. In the case of lake development, controlled aeration and bio-manipulation to enhance top down control of phytoplankton by selective removal of planktivorous fish may be adopted. It is recommended to avoid re-growth of **planktivorous fish** and to stimulate the growth of potentially **piscivorous perch.** The lake depth shall be maintained by periodically desilting and permanent solution to avoid the growth of water hyacinth in lakes may be given importance.

vii. The success of the program prominently lies in developing a participatory approach, imparting training and capacity building to all those involved in implementation, operation and maintenance."

10.35 On a specific query as to how was it ensured that adoption of innovative and best technology options for treatment of sewage was done on par with international standards the MoEF stated that all kinds of sewage technologies were good except that they have unique requirements for land and power, coupled with the reuse potential and the value thereof, such as for return to water bodies, agriculture, industrial and other specific uses. It was further submitted that the Detailed Project Reports remain technology neutral but clearly mention limitations and requirements regarding land, power availability, effluent standards and reuse potential. This Ministry had also issued an advisory on sewage treatment technologies options.

10.36 The Committee was informed that some of the State Governments had not submitted any proposal for selection of projects under NRCP. On being asked as to how it was ensured that State Governments submit such proposals in time and also to state how is the coordination made. The MoEF stated thereupon that it was the prerogative of the State Government to approach one of the several agencies currently funding sewerage schemes like Jawaharlal Nehru National Urban Renewal Mission (JNNURM), Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSM) and National River Conservation Directorate, etc. It was further submitted that the State Governments were requested regularly to send proposals for sewerage projects for towns/ cities which discharge directly in the river and the river had been identified by the Central Pollution Control Board as polluted. This was also followed up by meeting the senior officers in State Governments.

10.37 The Committee was informed that in order to ensure that the assets created for implementing Programs under NRCD are operated and maintained properly, a tripartite agreement is entered into with the local bodies, State

Governments and the NRCD. Asked whether these tripartite agreement were adhered to in practice, the Ministry replied that they form the basis for handing over of sewerage projects to the Urban Local Bodies, etc. who take care of their Operation and Maintenance.

10.38 In case of deviations from such agreements by any party, the MoEF clarifies that the State Government was requested to review such cases to take appropriate decision.

10.39 On further being asked as to whether room for review of these agreements was given to all the parties to incorporate changes as and when required. The MoEF stated that the agreement had been finalized in the Ministry and a copy was provided to the State Government, implementing agency and ULB/local body which formed part of the revised guidelines for DPR preparation.

10.40 The Committee was also informed that the ULBs were advised to generate revenue by sale of sludge, generating power using biogas, etc. to ensure proper functioning of STPs. So as to reduce Operation and Maintenance (O & M) cost of sewerage projects.

10.41 The Committee were further informed that the adequate manpower was provided for Operation and Maintenance (O & M) of assets created as part of agreement entered. In this connection, the MoEF was asked to state whether the manpower provided was qualified and adequately trained for their jobs and how the assessment was done. The MoEF thereupon stated that Operation and Maintenance (O & M) of sewerage assets created was the responsibility of Urban Local Bodies. Currently, Operation & Maintenance (O & M) was being outsourced by ULBs for proper maintenance of assets. Although, there was a condition stipulated in the Administrative approval and Expenditure sanctioned by the Ministry that trained manpower will be deployed to operate and maintain the assets.

10.42 On the issue of performance of STPs, the Committee was informed that the NRCD scientists visit the STPs as and when required to check the O & M of assets created. The Administrative approval issued by the National River Conservation Directorate (NRCD) stipulates a condition that the NRCD officers will visit the scheme for inspection and monitoring who should be given all cooperation during inspection. Any abnormality/ deviation found during inspection are brought to the knowledge of the project implementing authority, State Government and Project Director of the National River Conservation Directorate (NRCD) for further necessary corrective action.

10.43 The Committee were informed that CPCB had inspected 146 STPs (4387 MLD) and the actual utilized capacities of these STPs was found to be 3037.42 MLD which was 69% of the installed capacity. On being asked the reasons for underutilization of installed capacity of these STPs, the MoEF replied that as per latest information, Central Pollution Control Board has inspected 152 Sewage Treatment Plants (4716 MLD) (under National River Conservation Directorate component) and the actual utilized capacities of these STPs are found to be 3126.42 MLD which was 66% of the installed capacity. Out of 152 STPs, 08 STPs (4-West Bengal, 2-Tamil Nadu, 2-Andhra Pradesh) which were not funded under any MoEF scheme were also inspected. Main reasons for under utilization of installed capacity of these STPs included absence of Sewerage conveyance system; interrupted power supply; unskilled manpower; and irregular operation & maintenance.

10.44 The Committee were informed that no time line can be fixed for increasing levels of treatment of sewage because upgradation of STP capacity was an ongoing process due to increase in population leading to generation of more sewage as and when more areas get developed and taken over by the municipal authority. The Committee felt that at least a tentative time line can be drawn up after taking into consideration these factors. The MoEF thereupon replied that the

capacity addition for treatment of additional sewage generated was to be decided by the State Government depending upon their priority and budget allocation.

10.45 The Committee has been informed that disbursement of funds under NRCP which was earlier made directly to the State Governments, have now been made to the implementing agencies in the States to facilitate timely implementation. The State Governments are required to release their corresponding share of funds in the projects promptly as soon as central releases are made. Release of funds is linked to release of matching share by the State Government, submission of physical and financial progress reports, timely submission of Utilisation Certificates, constitution of Project Review Committees, proper Operation & Maintenance of assets.

10.46 On being asked as to whether there was any stipulation of time limit for release of funds by State Governments and what action was taken in case of inordinate delays in release of funds with consequential delay in implementation of projects, the MoEF stated that the State Government share for the sanctioned project was provided in their budget and released soon after sanction of Central Government share. As per Cabinet Secretariat instructions, inordinate delay in completing the project will entail investigation and fixing of responsibility on officer in the State Government for taking appropriate action against him.

10.47 On a specific query as to whether any monitoring mechanism exists for ensuring that the terms of Memorandum of Associations (MoAs) are adhered to by all the parties, the MoEF stated that there was a provision of State Monitoring Committee and also Central Monitoring by officers of the Ministry.

10.48 On being asked as to whether any action was taken in case of deviations of the terms of MoAs, the MoEF stated that the Memorandum of Agreement (MoA) was signed only when all parties agreed to abide by the conditions stipulated in the MoA. However, in case of serious violation, there was a provision in the Administrative approval that assets of the project under implementation may be

taken over by Central Govt. The expenditure incurred by the Central Government may also be recovered and deducted from the grants given to the State by the Planning Commission.

III. PERFORMANCE OF PROGRAMMES FOR CONTROL OF POLLUTION OF GROUND WATER

10.49 Audit scrutiny pointed out that neither MoEF nor the States have introduced any programmes to prevent pollution of ground water. They have also not addressed the concerns of pollution from agricultural sources. Although accountability structures at the central level have been established for management of pollution of rivers and lakes, the situation is more complicated with respect to groundwater with no central agency taking complete responsibility for ground water pollution. Also, the control activities which ensure accountability of technical and financial aspects of the projects are weak.

10.50 Audit further pointed out that at the Central level, MoEF does not implement any programme for treatment and restoration of ground water. No State had introduced any specific programmes for the restoration and treatment of ground water. Only two States viz. Tamil Nadu and Rajasthan have initiated programmes which addresses the issue of polluted ground water, but these are restricted to a few specific cases. The Schemes operated by MoWR focus on exploration, monitoring of the ground water regime through 15640 ground water monitoring wells located all over the Country. This data is used for assessment of ground water regime. Similarly, CGWB seeks to regulate withdrawal of ground water and identify critical and overexploited areas. However, none of its programmes or studies specifically addresses the issue of pollution of ground water.

10.51 On the issue of Ground Water Pollution, the Committee have been informed that a Vision Document on 'Mitigation and Remedy of Groundwater Arsenic Menace in India' have been brought out which contains information about the knowledgebase, understanding and technological opportunities available, state-

of affairs of arsenic contamination in India and different corrective measures taken and shortcomings experience. It also brings out a critical appraisal of gaps, identifies areas requiring future initiatives, a comprehensive plan of action envisaging Road Map, financial requirement and the method as to how the mission can be coordinated and accomplished.

10.52 On being asked as to when was this vision document prepared, the MoEF stated that the document titled “Mitigation and Remedy of Groundwater Arsenic Menace in India: A Vision Document” was Published in June 2010 by National Institute of Hydrology, Roorkee.

10.53 The Committee sought to know whether steps have been initiated in terms of this vision document to fight the menace of arsenic poisoning which was affecting the lives of many of our population. The MoEF thereupon replied that Water supply was provided by State Governments/ULBs and they have to meet the requirements of the Indian Standard for drinking water, IS: 10500 published by the Bureau of Indian Standards. Necessary treatment arrangements have to be made by States/ULBs for arsenic removal from drinking water as per standard or better source water may have to be tapped to meet the drinking water standards. The vision document was prepared to compile an up-to-date state-of-affairs on Arsenic contamination in groundwater in India including appraisal on knowledgebase, understanding, and technological opportunities developed in the subject matter both national and international level, success and failure stories etc. And also to identify research and field implementation gaps and probable actionable points for demonstrating of sustainable mitigation and remedial measure to the problem. The contents of the document had been contributed by select experts on the subject matter. After publishing this document in June 2010, National Institute of Hydrology, Roorkee and Central Ground Water Board, New Delhi had jointly organized a one day Dialogue Initiation meet on “Mitigation and Remedy of Groundwater Arsenic Menace in India” in June, 2011 at New Delhi in which, senior officials of Water Resources Departments of different arsenic affected States,

Public Health Engineering Departments, Central Government Ministries and Departments, expert Organizations/Institutions/Universities, individual, Industries and NGOs had been invited to take part in the meet.

10.54 The Ministry further submitted that the following recommendations were made from the deliberations of the aforesaid Dialogue Initiation Meet held in June, 2011 at New Delhi :

i. It was broadly agreed to have more extensive/intense brainstorming by experts followed by drawing of proposed plan of actions in the following areas/fields:-

a) Holistic/Comprehensive assessment of Arsenic related impacts and the adopted solutions;

b) Current needs of Research & Development interventions in different areas;

c) Gaps in Sensitization and Awareness generation at various levels;

d) Review of administrative/policy/operational framework for coping up and adapting to Arsenic problem.

ii. Further recommended to constitute a “Core Committee” drawing specialized experts from various streams/professions belonging to different academic/research organizations, concerned Government departments and other agencies and also working independently to work on above stated and other relevant issues for finalizing a suitable framework of activities including modalities of operation.

iii. The “Core Committee” shall be formulated in consultation with the Ministry of Water Resources, Government of India with specific ‘Terms of Conditions’.

iv. The “Core Committee” shall submit its report to the Ministry of Water Resources, Government of India who will take up the matter with the appropriate Ministry/Department for consideration and further follow up.

10.55 The Vision Document on 'Mitigation and Remedy of Groundwater Arsenic Menace in India' brought out by the National Institute of Hydrology, Roorkee, CGWB, New Delhi in June 2010 brings out the alarming critical state that indiscriminate exploitation of groundwater resources in many places in the Country with rise in deteriorated groundwater quality impinging not only scarcity of fresh groundwater resources but also contamination of ground water. The relevant portion of the Document pertaining to the critical dangers of the widespread problem of arsenic groundwater pollution, the key challenges, available options and the Road Map towards envisaged milestones are reproduced below.

10.56 Occurrence of Arsenic in groundwater, in excess to the permissible limit of 50 µg/L in the Ganges-Brahmaputra fluvial plains in India covering seven states namely, West-Bengal, Jharkhand, Bihar, Uttar Pradesh in flood plain of Ganga River; Assam and Manipur in flood plain of Brahamaputra and Imphal rivers and Rajnandgaon village in Chhattisgarh state, is one such large scale groundwater quality disaster, described internationally as the World biggest natural groundwater calamity to the mankind after Bangladesh. A framework of activities with an estimated financial target of ₹ 200 crores for a period of five years has been envisaged to resolve arsenic menace exposed in seven States in India. It is believed, earnestly, that likely results from these elaborated scientific tasks will help building the strategy to mitigate and remove groundwater arsenic menace in India.

10.57 It has been estimated that in Ganga-Meghna- Brahmaputra plain (including Bangladesh) alone, around 100 million people are at risk from groundwater arsenic contamination above WHO guideline. People in newly arsenic identified states could be in more danger, as many are not aware of their arsenic contamination in hand tube-wells and unknowingly continue drinking arsenic contaminated groundwater. In arsenic contaminated areas often arsenic contaminated

groundwater is used for agricultural irrigation resulting in excessive amount of available arsenic in the crops in that area. It has been reported that second to the ingestion of arsenic, after the direct consumption as drinking arsenic contaminated water, is through food chain, particularly use of contaminated rice followed by vegetables. This eventually indicates that the effects of this occurrence are far-reaching; and the sooner sustainable solutions to resolve the problem, lesser would be its future environmental, health, socioeconomic and socio-cultural hazards.

10.58 Even after spending huge amount of money for providing arsenic safe water to the villagers from contaminated hand tube-wells and other sources, the overall result suggests requirement of more concentrated and focused efforts in planning and management to cope up with such gigantic calamity. Attempts made so far to combat the menace of groundwater arsenic contamination, like, to identify the causes, to provide arsenic free drinking water to people dependent on groundwater supply, to reduce the arsenic related social and socio-economic problems and to develop cost effective technology for eradication of arsenic contamination have proven inadequate, fragmented and less responsive, as evident from the rise in number of arsenic affected areas with every new survey. There is, therefore, a need for adopting holistic approach to resolve solution considering management of science-society-resources together, but not merely healing the pain externally. Proper watershed management, possibility of tapping of freshwater aquifer linking to proper aquifer management, in-situ remediation of the problem and economical utilization of all available alternative safe sources of water need to be explored. To combat the arsenic crisis need for awareness and education of the villagers towards the dangers of arsenic toxicity and importance of using arsenic safe water. This can only be achieved by active community participation and whole-hearted support from government and arsenic researchers.

10.59 A good portion of 500 million people, living in the 5 69749 sq km of the Ganga-Meghna-Brahmaputra belt, live in danger of drinking arsenic contaminated water. Around 30 % of this populace is constituted of illiterate inhabitants who live

below the poverty line. Affected populace are those who are economically backward and lack in nutritious food. Women are affected the most compared to men. Further, infants and children are adversely affected than the adults. An arsenic patient loses his strength and cannot work outdoors, but his family incurs more expenses than before because of his illness. Many of them borrow money from the local moneylender who charges them a high rate of interest, i.e. 5-10% monthly compound interest. Often villagers lose all their earthly possessions including the roof over their heads, trying to pay the moneylender back. Society too, turns an arsenic patient into an outcast. The arsenic problem, thus, has a major effect on the socioeconomic structure. People often mistake symptoms of arsenic poisoning for leprosy or other contagious skin diseases, and thus marriage, employment, and even the simplest social interaction become impossible for the victim. Thus, an arsenic patient often becomes depressed and sometimes even tries to commit suicide. Similarly, certain area of Punjab is known as cancer belt due to contaminated ground water.

ALTERNATE APPROACH FOR ENSURING SUPPLY OF ARSENIC-FREE WATER

10.60 Watershed is considered to be the basic unit of land-water management practices. From hydrological point of view, watershed possesses all characteristics generally required for conservation and development of water resources. Surface water is arsenic-free, and it is more so when rainwater is harvested as surface storage. Harnessing, developing and appropriate management of surface water, on a watershed basis, in arsenic affected areas and their usages in irrigation and other domestic purposes, can be a potential alternative. Conjunctive use of surface water (either from watershed development or from other sources) and *in-situ* groundwater can be another potential alternative. A technical feasibility study, considering risk, cost and benefit of each alternative, would form an important task.

10.61 Whatever technological options that are adopted, the success and effectiveness of that task cannot be achieved unless end-users and beneficiaries of the schemes are debugged from concern and responsibility. No strategic planning

of availability of safe and wise use of water can be sustained by delinking user community and their effective participation in the management of traditional and new resources. Obviously, for the success of the program, people's awareness, regarding importance of water, its know-how on 'dos and don'ts and rightful uses, need to be tagged as a mandatory task. Removal of as from arsenic-contaminated water by suitable filtration techniques, to ensure supply of arsenic-free water, appears to be a viable practical solution for potable water if the related problems, such as sludge disposal and operation & maintenance, are resolved effectively. But the agricultural requirement is much more than potable water. Supply of treated groundwater to meet agricultural requirement by *ex-situ* arsenic removal technologies would not be a sustainable option or approach. Without adequate in built maintenance arrangements apparently the performance of all the devices would suffer. Proper training and mobilization of the user community in the operation and maintenance aspect would be an essential task before any future installation of ARP programme can be envisaged. Thus, future emphasis should be oriented around in-situ remediation at the source-aquifer level and also chemical fixation of the contaminant at the source should be properly explored through proper calibrated and configured studies and experimentations.

10.62 The primary task of providing Arsenic safe water to millions of people needs to address the critical concerns viz. Water quality monitoring through District & Block level Capacity Building; Identification of Arsenic contaminated as well as safe sources: both public & private; Provision of alternate sources of Arsenic free safe drinking water; Village specific GIS Database and Action Plan and sharing the same with all stakeholders; Establishing a transparent system of information sharing by all stakeholders; Health Education and Awareness Generation; Health Risk Assessment and estimation of disease burden; Provision of Medical Relief for the critically affected people; Training of Medical Practioners in Govt, as well as outside the same; Long-term change in agriculture and Irrigation practice and Restricting the use of Groundwater. In addressing the key-concerns and developing a National Plan of Action, for providing Arsenic safe water to the community, the 1st

key-step is to establish a National Standard for Arsenic in Drinking Water. The present guideline value of Arsenic in groundwater of WHO is 10ppb, many Countries are still adhering to the standard of 50 ppb of Arsenic.

IDENTIFICATION OF CONTAMINATED SOURCES AND CREATION OF DISTRICT, BLOCK AND VILLAGE LEVEL DATABASES: KEY CHALLENGES

10.63 In West Bengal, all public tube wells have been tested through a net work of rural laboratories. Near about 150,000 water samples have been analyzed in the block level laboratories. And GIS Database has been created at the district, block and habitation level. However, the most challenging task, which is yet to be accomplished, is the testing of near about 500,000 private sources. Adding to the menace, the identification of contaminated public tube wells remains incomplete in other states like Bihar, UP, Jharkhand, Chhattisgarh, Assam etc. Though organizations, like SOES, Jadavpur University, Sriram Institute and quite a few others have done remarkable work, the basic task of identifying all arsenic contaminated sources, public as well as private, remains largely incomplete. If we consider the tube wells' use for irrigating and vegetable plants, in the arsenic affected districts, the task becomes more difficult and complex.

FIELD TESTING KIT VIS-À-VIS NETWORK OF LABORATORY

10.64 The magnitude of the tasks involved raises the question of use of field kits vis-à-vis creation of network of block/village level laboratories. In West Bengal, considering the risk of false positive and false negative data, by the use of field test kits, the Arsenic Task Force opted for creation of a network of rural laboratories, at the rate of one laboratory for every three blocks, through Public Private Partnership. As a matter of fact, the Arsenic crisis in West Bengal has been a blessing in disguise, in the sense that it has resulted in development of institution and capacity, at the block and village level Panchayatiraj organizations, for water quality monitoring and surveillance. It must, however, be noted that though the above

system has been successful in monitoring public sources, the big question remains on the monitoring of water quality of the private sources. However, the precision and dependability of the same is always open to question. The challenge is to produce field test kits, which are robust, reliable, cheap and simple enough to be used by relatively unskilled users in the villages of India. It is also imperative to say tat these field kits and supplies should be readily available for the rural markets.

PROVISION OF ARSENIC SAFE WATER TO THE COMMUNITY: THE KEY CHALLENGE OF SUSTAINABILITY

10.65 In West Bengal, the Master Plan envisages supply of arsenic safe water, to all the affected habitations, through a system of piped water supply, which would be fed from treatment plants after appropriate treatments. 40% of the villages would be supplied from mega water treatment plants, drawing water from large perennial rivers like the Ganga. They would supply water through kilometers of water distribution system after appropriate treatment for bacteriological purification. 60% of the villages would be served by mini-piped water supply network, which would be fed from large diameter tube wells after removing arsenic by using appropriate technology. This is the most ambitious long term mitigatory programme undertaken by any State Govt. for the arsenic affected rural community. The implementation of the master plan is expected to be completed by 2011. But the progress of work indicates delay in project execution. The more vital question that remains to be answered is that, whether such a capital intensive approach could be sustainable in the long run. Effected operation and maintenance of the system, through people's participation in cost sharing and maintenance, could go a long way in ensuring sustainability. The success of West Bengal experience could set a model for nation wide replication. However, to make a community based scheme sustainable, the

Govt. effort needs to be supplemented. These efforts can be community based approaches through the implementation of decentralized small scale community maintained rural water supply projects, based on traditional surface water sources, that are largely supported by rain water harvesting. There are millions of traditional surface water sources like ponds and dighis in states, like West Bengal, Bihar, UP, Jharkhand, Chhattisgarh, Assam etc, which could be rejuvenated, conserved and utilized.

10.66 Existing Knowledge Gaps covers inadequacies in the assessment of Health Impact : Scientific Health Risk Assessment and Rational Estimation of Disease Burden; Arsenic Contamination in Agriculture: A Threat to Water - Soil- Crop - Animal - Human Continuum; Critical Needs for Research and Capacity Building; Technology Options: Critical Constraints and limiting factors; Key Factors Impeding the Progress of Mitigatory Programmes in the Arsenic Affected States; and Establishing a Transparent System of Information sharing by all Stakeholders.

10.67 The Vision Document provides a Road Map for achieving Envisaged Targets and Important Milestones. Milestones are the events, which are envisaged as future course of actions to achieve the targeted goals. The targeted goals in this case are: (a) to make arsenic contaminated aquifers conducive to preserve groundwater quality and produce arsenic free groundwater to meet drinking and irrigation demands, (b) to find sustainable techniques and technologies for decontamination of aquifers from arsenic and for the removal of arsenic from contaminated water, (c) to scale up scope for unveiling alternate sources of water to meet the demand of potable water in the arsenic affected and vulnerable areas, (d) to eradicate health hazards, originating from ingestion of arsenic contaminated water, and (e) to make society responsive to unconscious usages of water. The milestones to achieve these envisaged tasks are as follows:

(i) Emerging R & D Activities - to prepare database, improvise and translate understanding of causes, geochemistry, genesis, aggravation, mobilization and dissolution processes of arsenic in groundwater for different hydro-geological settings to

derive methods for in-situ remedy for decontaminating aquifers from arsenic; to devise cost effective, eco-friendly and socially accepted arsenic removal devices; to investigate feasibility of alternate sustainable water management (SW & GW) strategies to meet demand of water in the arsenic affected and vulnerable areas, to assess impact of arsenic in food chain and related health hazards, to ascertain health impact of arsenic contaminated groundwater, etc.

(ii) Ensuring Arsenic Free Water- activities and plan of actions to provide arsenic free drinking water to the people in affected and vulnerable areas,

(iii) Capacity Building and Social Empowerment - activities to promote public awareness, capacity building and social empowerment about importance of water and its effective usages, health related issues, ill-effects of using contaminated water, etc.

Revisit to revise National Standard for Arsenic in drinking water: to consider revision of the National Standard for Arsenic in drinking water in the light of the WHO's present guidelines.

CHAPTER - XI

MONITORING OF PROGRAMMES FOR CONTROL OF POLLUTION OF RIVERS, LAKES AND GROUND WATER

11.1 Audit findings pointed out that inspection and monitoring of projects being implemented under NRCP and NLCP was inadequate at all three levels, i.e., local level, State level and Central level. It was observed that the data for monitoring the schemes as available in MoEF provides a user-friendly means of understanding the current status of the relevant policy and was reasonably cost effective to operate. However, it did not describe in detail the stages or events used for rating progress (when this method was used). It also did not provide a rationale how future performance targets were being set in the Ministry. There was poor monitoring of network to track pollution of water in rivers and lakes, failure to update and revise water quality parameters, absence of database, poor dissemination of data, etc. In turn, poor internal controls reveal the low level of transparency in the activities of the Ministry and their impact on its overall accountability. The targeted impact of schemes or programs can be achieved only with the proper and effective implementation. For the monitoring to be effective, an organization develops the system which covers the micro monitoring at the ground level of implementation i.e. at the implementing agency level. On the other hand, macro monitoring at the apex level will ensure that such monitoring system was working effectively. Audit findings also pointed to paucity of network for tracking pollution of rivers, lakes and ground water. Audit scrutiny further pointed lack of classification of locations as baseline, trend and flux stations; lack of real-time monitoring of water Pollution; Lack of assessment of trophic status of rivers and assessment of ecological/biological indices of rivers/lakes; lack of revision and updating parameters of water quality; poor quality of data on water; lack of regular inspection of the projects by MoEF; and non-availability of completion reports of projects.

Trophic status is a measure of biological productivity of lakes/rivers, which simply is a measure of how many plants and animals are in the lake/river. Thus, it is an indicator of health of a river.

11.2 Audit further pointed out that the monitoring of projects under NRCP/NLCP at Central Level viz. National River Conservation Authority headed by Prime Minister for six monthly review of progress had the last meeting in June, 2003; Monitoring Committee headed by Member, Planning Commission with quarterly review of progress had last meeting in April 2002; Standing Committee headed by Union Minister, Environment and Forests for quarterly review of progress had the last meeting in March, 2003; and Steering Committee headed by Secretary, MoEF for quarterly review of process had last meeting in December, 2007. Moreover, the four Committees do not exist in a hierarchy and operate independently of each other and there was no functional connect amongst them and as such no evidence of sharing of their findings and recommendations amongst these Committees were found by Audit. In the States, while the periodicity of review varied from State to State, monitoring of projects under NRCP/NLCP were done by High Powered Committee headed by Chief Minister of the State, State Steering Committee headed by Chief Secretary of the state, Inter-Departmental Committee headed by the Chief Secretary with Principal Secretaries of the Departments concerned; Review by Nodal Implementing Agency; Divisional Project Monitoring Cell (DPMC) and Lake Specific Consideration Committee.

11.3 The Committee sought to know the reasons for frequent meetings of these Committees and whether these Committees still exists. The MoEF did not give any categorical reply but merely stated that all these Committees still exist and meetings are held as and when required. It was further submitted that meetings would be organized soon and coordination would be ensured.

11.4 Audit scrutiny revealed that out of 140 river projects test checked, MOEF submitted information only in respect of 99 projects. Of these, 25 per cent of the projects were not inspected by MoEF even once during implementation. Out of 105 projects completed, MOEF submitted information in respect of 77 projects. MoEF had not inspected 43 per cent of these projects after completion.

11.5 In this context, the Committee sought to know what steps were being taken/ proposed by MoEF to enhance the scope and coverage of the Water Quality Monitoring Programme in terms of the number of monitoring stations, their location, automation and updation of their parameters. The MoEF thereupon replied that as required under the provisions contained in the Water Act, 1974, CPCB along with SPCBs was monitoring water quality of surface and ground water bodies under the National Water Quality Monitoring Programme (GEMS/MINARS/YAP). Water quality was monitored for assessment of wholesomeness of water for various beneficial uses. Their present monitoring network comprises of 2000 locations in 27 States and 6 Union Territories spread over the country, which covers 383 rivers (1085 locations), 127 lakes, 9 tanks, 59 ponds, 40 creeks/seawater, 17 canals, 34 drains and 595 wells. The water quality data was published and circulated. Automatic water quality monitoring stations were proposed to be installed on river Ganga to further strengthen the manual monitoring carried out on river Ganga. The data so obtained are published regularly by CPCB. The data analysis for a particular monitoring station would indicate trends if parameters were varying with respect to time, no change in data provides baseline status of the ground water quality and station located near source of pollution indicates impact of activities on the ground water. Additionally, water quality monitoring stations were also set up under NRCP through different universities and academic institutions for assessing the impact of various pollution abatement schemes on water quality of these river stretches. So far, the major monitoring thrust had been in the Gangetic basin. With schemes being taken up on other rivers, the monitoring programme of the Directorate had been extended to other rivers. The objective of the monitoring programme was to establish the water quality in the rivers before the schemes were taken up and then compare it with the quality as the implementation of scheme progresses in order to check the efficacy of the actions taken. The locations are usually closely spaced downstream of cities and wastewater outfalls. The locations may be classified as Baseline and Impact stations for pollution monitoring. The water was analyzed mainly for 9 core parameters with pollution related parameters,

such as BOD, DO and coliforms. Site specific measurement of heavy metals is also included. Water quality monitoring stations and their locations had been selected from time to time as the River Conservation Programme covered more and more towns and cities. Since 2005, a Uniform Protocol on WQM had been notified which details on sampling locations, frequency, parameters and analytical techniques. The same was currently in force.

11.6 Asked how the MoEF ensures that CPCB regularly collects, stores and disseminates the Water Quality Monitoring data through its website or by electronic mail to various users on demand, the MoEF replied that automatic water quality monitoring stations were being installed on river Ganga and river Yamuna to further strengthen the manual monitoring on both the rivers. The data so obtained is published every year by CPCB and also available on their website which can be assessed by any individual. The Ministry had funded Centrally Sponsored project and established “envis centres” in the Country including CPCB which disseminate information related to all aspects of environmental pollution including water quality data, etc. to the public and other users.

11.7 The sanction orders issued by the Ministry stipulate that a Monitoring Committee would be constituted to monitor the progress of the project/ scheme. The monitoring Committee have been constituted by various State Governments for monitoring the ongoing projects/ schemes. At the initiative of this Ministry, City Level Monitoring Committees (CLMCs) have also been constituted for regular monitoring of ongoing project/schemes. In the light of experience gained in the implementation of GAP and NRCP, it was now recognized that effective civil society / public participation can only bring about full success of the programme. As per the revised guidelines, it was necessary to formulate an effective public education, awareness and participation programme as part of DPR so as to make the projects socially acceptable. An expert agency with right kind of background and experience may be engaged to formulate Public Participation strategy. Two types of outcomes were expected from this activity. The first one was public participation and through it

agreement on complex issues like house connections, water conservation at household levels, proper collection of garbage so that it does not choke sewers/drains, sharing increased burden of O&M cost, proper layout of sewerage systems and location of STPs, diffusing conflicts, if any, on programme components etc. This can be best achieved through consultation at various stages of project formulation and implementation. The second one was increasing public understanding about the programmes through awareness. This should be achieved through workshops, seminars, street plays, city runs and riverside walks. Active involvement of students and teachers community in schools and colleges can greatly help in achieving the objectives. Public can also play the role of a watchdog in supervising project implementation and operation and maintenance which would help improve the quality of the programme. Emphasis may be placed on increasing public participation under NGRBA. Apart from hiring expert agencies for this purpose, arrangements to involve Nehru Yuva Kendra Sangathan have been put in place, which should be integrated with this component. Under the NLCP scheme also, public awareness and public participation had been one of the integral components of all the sanctioned projects. The projects under execution were being monitored by the officers of the Ministry at regular interval and observations are communicated to the implementing agency/ State Government for appropriate action. On the basis of past experience, Ministry had taken several steps to prevent time and cost overrun. The Memorandum of understanding and tripartite agreement was signed between the implementing agency, State nodal agency and local body to avoid time and cost escalation. The DPR was approved only when State Governments has indicated that land was available. The projects were designed on the basis of data collected and appropriation correction factor was applied. However, due to variety of unforeseen reasons, full utilization of installed capacity was not possible. One of the reasons of under utilization of capacity of STP was inadequate collection of sewage from city due to incomplete coverage with sewers. This had since been addressed in new guidelines prepared by NRCD. Accordingly, whole city will be covered for sewerage projects rather than only interception & diversion of sewage from selected few drains. The problem of pollution in rivers

would have been worse in the absence of the pollution abatement works taken up under the river conservation programme. Based on independent monitoring undertaken by reputed institutions on some of the major rivers under NRCP, the water quality in terms of BOD (Bio-chemical Oxygen Demand) values has improved at most locations as compared to water quality before taking up of pollution abatement schemes. The major reasons behind continued pollution of rivers are gaps in the treatment capacity, increasing population leading to demand on fresh water, improper O&M of assets created, industrial pollution, contribution of non point sources, etc. In the new project to be sanctioned, conditions relating to online monitoring at the discharge point of the streams and river confluence are included in the approval. This information would be uploaded on a dedicated website for the project.

11.8 On a pointed query as to the current status of inspection of the projects, the MoEF stated that it was proposed to give more thrust to the monitoring of ongoing and completed projects.

11.9 Audit scrutiny revealed that CPCB/CGWB do not carry out real-time monitoring of water pollution in rivers, lakes and ground water and such poor monitoring of network to track pollution, failure to update and revise water quality parameters, absence of database, poor dissemination of data, etc. reflects poor internal controls.

11.10 Asked whether MoEF had initiated any real time monitoring of water pollution so that red flags are raised immediately when pollution levels rise alarmingly for timely intervention, the Ministry stated that Central Pollution Control Board has initiated the process for installation and communication of Ten Real Time Water Quality Monitoring Stations (8 in Ganga and 2 in Yamuna) which were the remotely controlled stations and likely to start functioning shortly.

11.11 About the steps initiated for improving both the quantity as well as quality of data base and its dissemination with respect to water pollution monitoring data, the MoEF stated that the Central Pollution Control Board had initiated the process for development of web based Geographical Information System (GIS) to disseminate the data and it was likely to be operational by the end of 2013.

11.12 The Committee sought to know whether any steps had been taken to strengthen the monitoring network by converting all monitoring locations with stations and reclassifying as baseline, trend and flux stations for achieving better quality data in accordance with the Audit recommendation. The MoEF replied that Water Quality monitoring station having Bio chemical Oxygen Demand (BOD) less than 3 mg/l are baseline stations. Stations falling between the BOD level of 3 & 6 mg/l are Trend stations. Bio chemical Oxygen Demand (BOD) exceeding to 6 mg/l are classified as impact stations.

11.13 Setting up of monitoring stations and real-time monitoring of water quality, the Ministry stated that MoEF through Central Pollution Control Board will establish Real Time Monitoring Stations on polluted river stretches after giving equipments on 10 monitoring stations. The work of real time monitoring in polluted river stretches will begin from financial year 2013-14.

11.14 On being asked as to whether MoEF have plans to set up separate baseline stations, flux stations and trend stations, the Ministry replied in the negative and stated that at present, there was no such plan to set up separate stations.

11.15 On the question of organizing regular meetings of National River Conservation Authority (headed by the Prime Minister), Steering Committee (Headed by the Secretary, MoEF) Standing Committee (Headed by the Union Minister, Environment & Forests) and Monitoring committee (Headed by the Member, Planning Commission), it was submitted that the National Ganga River

Basin Authority had been constituted in February 2009 and attempt would be made to convene meetings more frequently.

11.16 The Committee further sought to know, how was it ensured that water samples are collected from designated spots since MoEF only has monitoring locations and not monitoring stations. The MoEF replied that all the monitoring locations are geo referenced and landmarks are followed for collection of water samples.

11.17 River quality monitoring reports in India report only averages of various parameters like Total Coliform (TC), Dissolved Oxygen (DO) and Faecal Coliform (FC), etc. which is misleading as averages tend to camouflage rise in TC/FC or drop in DO and levels of river pollution will be more accurately reflected if absolute values are given for a particular month. The Committee sought to know whether the MoEF intend to provide absolute values as average values do not reflect the true picture of pollution level in the river. The MoEF thereupon stated that the water sample was collected only once a month at a particular station and analysed. For 12 months, only 12 observations were available for a particular parameter at the same station. The report, therefore, quotes only maximum , minimum and mean value for particular parameter at a particular station. Total number of observations might be less than 12 in a month due to variety of reasons. But all values are quoted as Minimum, Maximum and Mean for that month. There were about 20,000 observations in a year and publication of such huge data will make the reports bulky. The water body being dynamic, quality of water changes with time and place of monitoring, due to limitation of resources available, it was also not possible to collect sample every day and analyse it for parameters and report all values for all 30 days. The Data was processed statistically to reduce the volume and prevent confusion while interpreting their significance. Therefore, the present methodology of reporting the water quality data was satisfactory.

CHAPTER - XII

RESULTS OF PROGRAMMES FOR CONTROL OF POLLUTION IN INDIA

12.1 Audit findings reveal that there is no nation-wide impact assessment relating to the pollution of ground water. Though river cleaning and control of pollution programmes for polluted rivers are being implemented since 1985. The thrust of these programmes has been to stop sewage from polluting our rivers. The programmes have also tried to stop non-point sources of pollution through construction of low cost sanitation, electric crematoria, etc., however, the data on the success of these programmes are not very encouraging. With the Exception of Ganga in certain stretches, all the other rivers test checked in Audit i.e., Yamuna, Gomti, Godavari, Musi, Cauvery, Cooum, Mahananda, Khan, Kshipra, Vaigai, Chambal, Rani Chu, Mandovi, Sabarmati, Subarnarekha, Bhadra/Tungabhadra, Pennar, Pamba, Betwa, Krishna, Sutlej, etc., continue to be plagued by high levels of organic pollution, low level of oxygen availability for aquatic organisms and bacteria, protozoa and viruses which have faecal-origin and which cause illnesses. These rivers are the lifeline of India and its States and people depend on them not just for water but also for livelihood. With respect to lakes across India, many of them have disappeared due to drying up of their catchment areas which have been reclaimed for uses like urbanisation. Most lakes in India are under threat from nutrient overloading which is causing their eutrophication and their eventual choking up from the weeds proliferating in the nutrient-rich water. Implementation of NLCP in conserving these lakes has had no discernible effect. Lakes support not only humans for livelihood like tourism and fishing but also support very diverse biodiversity which is disappearing from the levels of pollution entering our lakes. All the lakes test checked by in Audit namely Pichola, Pushkar, Dimsagar, Banjara, Kotekere, Bellandur, Veli Akkulam, Shivpuri, Powai, Rankala, Twin lakes, Bindusagar, Mansagar, Mansiganga, Rabindra Sarovar, Mirik, Kodaikanal lake, Dal lake, Laxminarayanbari Lake,

Durgabari Lake, Nainital lake, etc., not only support livelihood but are unique eco-systems supporting a wealth of biodiversity.

12.2 Audit Report stated that the assessment of results is an important step in reaching a conclusion about efficacy of any programme. It is undertaken to ensure that projects, programmes and policies are economically viable, socially equitable and environmentally stable and delivering the intended results.

12.3 Audit further observed that programme for prevention and cleansing up of major rivers in India have been in operation for more than two decades now and therefore it is important to assess the results of such programmes. Audit pointed out that while MoEF claimed that Ganga River Water quality data from 1986 to 2009 indicated improvement in water quality between Kannauj and Varanasi, CPCB stated that the natural flow in rivers and streams had reduced drastically due to diversion of water for irrigation from all reservoirs in the Country and there is little fresh water flow or flow generated due to discharge of sewage and industrial effluents. It also stated that the improvement in various environmental components could not be quantified.

12.4 DO is a relative measure of the amount of oxygen that is dissolved or carried in the water body. Adequate dissolved oxygen is needed and necessary for good water quality. This is important to the sustainability of a particular ecosystem. Insufficient oxygen in lakes and rivers, tends to suppress the presence of aerobic organisms such as fish. Deoxygenation increases the relative population of anaerobic organisms such as plants and some bacteria, resulting in fish kills and other adverse events. If water is too warm, there may not be enough oxygen in it. When there are too many bacteria or aquatic animal in the area, they may overpopulate, using DO in great amounts. Oxygen levels also can get reduced through over fertilization of water plants by run-off from farm fields containing phosphates and nitrates (the ingredients in fertilizers). Under these conditions, the numbers and size of water plants increase. Then, if the weather

becomes cloudy for several days, respiring plants will use much of the available DO. When these plants die, they become food for bacteria, which in turn multiply and use large amounts of oxygen. As evident from the **Chart 12.4(i),** the level of Dissolved Oxygen was precariously low in the Sabarmati at Ahmedabad, Yamuna at Delhi, Musi at Hyderabad, Yamuna at Ghaziabad, Adyar at Chennai and Gomti at Lucknow. BOD is a chemical procedure for determining the uptake rate of dissolved oxygen by the biological organisms in a body of water and is widely used as an indication of the quality of water. It can be used as an indicator of the efficiency of sewage treatment plants. Similarly, as can be seen from the **Chart 12.4(ii)**, the levels of BOD in some major towns was at alarming levels. Total Coliform (TC): Coliforms organisms like fecal bacteria are an indicator of water quality. Coliform bacteria may not cause disease, but can be indicators of pathogenic organisms that cause diseases. The latter could cause intestinal infections, dysentery, hepatitis, typhoid fever, cholera and other illnesses. Coliform bacteria are organisms that are present in the environment and in the feces of all warm-blooded animals and humans. Coliform bacteria will not likely cause illness. However, their presence in drinking water indicates that disease causing organisms (pathogens) could be in the water system. These can also occur due to soil, vegetation, sediment, insects entering the water, and their presence indicates that the source is, or recently has been compromised by surface water. The **Chart 12.4(iii)** shows the actual TC in MPN/100ml against norms. It may be seen that all the Charts below indicate a particularly dismal position with regard to breach of norms in terms of the three criteria- BOD, DO and TC in the case of Yamuna at Ghaziabad/Delhi, Gomti at Lucknow and Sabarmati at Ahmedabad. In the case of Musi at Hyderabad, for which data on BOD and DO was available, the pollution levels was far beyond the norms.

Chart 12.4(i) : Showing Actual DO in mg/l Against Norms

Chart 12.4(ii) : Showing Actual BOD in mg/l Against Norms

Chart 12.4(iii) : Showing Actual TC in MPN/100 ml Against Norms

12.5 Audit findings on parameters of quality of water in test checked river stretches all over the Country indicated that despite more than 26 years of implementation of programme to control pollution of rivers, water in our rivers remains critically polluted. The levels of BOD, DO and TC are indicators of high levels of organic pollution in our rivers, the inability of our rivers to sustain aquatic life due to presence of pollutants and high levels of disease causing, faecal-related bacteria, viruses and protozoa which cause illness; all of which point to failure of the efforts of the government to control pollution in our rivers through NRCP. Water quality challenges have been exacerbated by extraction of water for different uses reinforcing the need for adopting basin approach for management of water.

12.6 Audit pointed out that though NLCP had been in operation for more than 10 years, MoEF/CPCB had not assessed whether there was measurable improvement in chemical parameters of lakes during implementation/completion of the project. Though the MoEF stated that water is a State subject and pollution prevention and conservation of water bodies including lakes remain the domain of State Governments and NRCD in MoEF is only supplementing the efforts of State Governments in conservation of lakes through centrally sponsored scheme of NLCP, audit pointed out that being the primary funding agency and being mandated for prevention of pollution MoEF needs to take greater responsibility for the projects funded by it.

12.7 Audit findings further pointed out that despite increasing pollution of ground water sources and the presence of contaminants like arsenic, nitrate, fluoride, salinity, etc, no programmes at the Central level and the State level were being implemented for control of pollution and restoration of ground water. Hence no impact assessment was possible in the absence of programmes.

CHAPTER - XIII

RESOURCES AND UTILISATION OF FUNDS

13.1 The financial resources for control and prevention of water pollution come from Government budgetary support and Water Cess collected under the provisions of the Water (Prevention and Control of Pollution) Cess Act, 1977. The Central Government pays the Central Pollution Control Board and the State Pollution Control Boards such amount of money as it may think fit for being utilised under the Water (Prevention and Control of Pollution) Act, 1974 from the proceeds of Water Cess collected after deducting the expenses on collection. MoEF, being the nodal Ministry, is responsible for protection of environment including environmental threats arising from Water pollution. Funds are transferred directly from the Central Government (MoEF) to implementing agencies of State Government such as municipalities, Jal Boards, Sewerage Boards, Lake Development Agencies, etc for implementation at the ground level instead of being routed through State Government as was done prior to June, 2003. Audit further pointed out that funds available for control and prevention of water pollution and restoration of wholesomeness of water were not adequate for the Country as a whole. Audit scrutiny pointed out that resources generated from water cess for control and prevention of Water Pollution were very meager, averaged to ₹ 3.28 crores per State/UT per year during the last five years. This miniscule amount of allocation was barely sufficient for monitoring of pollution level. The Water cess rate was revised two times during the last 34 years in 1992 and 2003 and is currently set notionally with extremely low rate structure payable by various users at the rate ranging from two paisa to fifteen paisa per kiloliters and defaulters liable to pay a higher rate of three paise to thirty paisa per kiloliter. The total Water Cess of ₹ 853.54 crore collected during last five years (2005-2010) constituted 10.75 per cent of total expenditure of MOEF. The disbursements to CPCB and SPCBs, amounted to ₹ 820.65 crore.

13.2 As regards expenditure on control and prevention of water pollution, audit findings pointed that 26 to 36 per cent of MoEF budget was spent on control and prevention of water pollution during the last five years (2005-2010). Out of a total expenditure of ₹ 2517.33 crore on control and prevention of water pollution, ₹ 1697.18 crore were spent on programmes of NRCP/NLCP and ₹ 820.65 crore were given as grants to SPCB and CPCB. The funding pattern of NRCP/NLCP Programmes is 70:30 between Central and State Governments.

13.3 The audit pointed out that since Ganga Action Plan II started in 1993, the scope of NRCD was widened into National River Conservation Programme. A total of 1079 projects worth ₹ 4724.24 crore were sanctioned by MoEF and ₹ 3041.91 crore released up to March 2010 for NRCP. For NLCP, 58 projects worth ₹ 883.96 crore were sanctioned by MoEF against which funds of ₹ 327.89 crore were released upto March 2010.

13.4 On the utilisation of funds released under NRCP, audit observed that out of 20 States, total expenditure in respect of 10 States was less than the amount released by NRCD. The total expenditure of these 10 States was ₹ 540.14 crore out of ₹ 652.11 crore. This indicated that the progress of expenditure was slow and surplus out of NRCD funds amounting to ₹ 111.97 crore in addition to 30 *per cent* share of State was lying in interest earning accounts of banks as per the terms of sanction and release of MOEF. Further, out of ₹3041.91 crore released to 20 States, 87 *per cent* of total release amounting to ₹2660.01 crore was given to eight States. In the remaining States, audit observed that total expenditure in respect of seven States was less than the combined total of funds released by NRCD and State share. Only two States i.e. Goa and Punjab had spent funds equal or more than total of funds released by NRCD and State share. NRCD could not furnish the information in respect of funds released for test checked projects separately as funds were released directly to implementing agencies for clusters of project and not project-wise.

13.5 As regards utilisation of funds released under NLCP, audit pointed out that out of ₹883.96 crore of sanctioned projects to 14 States, 58 per cent of total sanctioned projects amounting to ₹513.73 crore were sanctioned to only two States namely Jammu and Kashmir, and Rajasthan. Although NLCP compiled information on approved cost of projects and funds released, it did not compile information relating to project-wise expenditure and total expenditure on all projects based on UCs received from States. Therefore, total expenditure on all projects with total release of funds could not be compared. Audit findings also pointed out that in absence of effective monitoring of use of funds, NRCD also could not verify diversion of funds, inefficient utilisation of funds, failure of States to contribute their matching share, balance lying unspent from completed projects, interest income earned and credited to the account of implementing agency but not disclosed in UCs for adjustment in further release, etc., as in the case of NRCP. Further, NRCD neither devised any effective system to exercise diligent financial management nor ensured furnishing of all relevant information by the implementing agency for effective control on utilisation of funds.

13.6 Audit concluded that funds available for control and prevention of water pollution and restoration of wholesomeness of water were not adequate for the Country as a whole. There were instances of poor financial management like diversion of funds, non-disclosure of accrued interest; failure to contribute matching grants, cost escalations and overruns which were not to be shared by NRCD; funds not utilised; funds lying idle and parked in bank accounts, unspent balances not refunded, etc., in the implementation of the projects. The quality of utilization certificates was poor. Further, due to tardy implementation, the government had to spend more funds on these projects than originally sanctioned.

13.7 In this connection, the Road Map of MoEF contains the following recommendations on Financial Aspects :

- While issuing sanctions to the projects, a condition is made that cost overrun, if any, will be borne by the State Governments/ ULBs concerned. The GoI's liability in the project is thus limited to the initially committed share at the time of sanction of projects. This condition is included also in the Memorandum of Agreement with the State Governments/ULBs. This condition should be scrupulously followed and it is ensured that no cost overrun is borne by the GoI except in the cases where revisions of scope in works/ schemes are involved.

- Many measures have been taken from time to time for effective utilisation of funds and speedy implementation of the projects. Earlier, disbursement of funds under NRCP was being made directly to the State Governments. However, delays were noted in general in fund transfers by the States to the State Implementing Agencies implementing the projects. To facilitate timely implementation, Central Government had started disbursing funds directly to the implementing agencies in the States. The State Governments are required to release their corresponding share of funds in the projects promptly as soon as central releases are made.

- Several new measures have been initiated for effective utilisation of funds and improved implementation of project. These include public consultation in project formulation and implementation, signing of tripartite MoAs with States and urban local bodies (ULBs), appraisal of projects by independent institutions, Third Party Inspection (TPIs) for review and monitor performance of the projects funded under the NRCP & NGRBA on the basis of detailed on-site review, examination of documents through the entire life-cycle stages of the projects namely pre-construction, construction, commissioning & trial run and post-construction . The MoAs have several important commitments on the part of State Governments/ULBs where release of funds is linked to release of matching share by the State Government, submission of physical and financial progress reports, timely submission of Utilisation Certificates, constitution of Project Review Committees, proper Operation & Maintenance of assets. State Governments

should strictly fulfil the commitments made to the Central Govt. for speeding implementation of sanctioned projects.

CHAPTER - XIV

PUBLIC AWARENESS, COMMUNITY INVOLVEMENT AND PARTICIPATION

14.1 Audit pointed out that programmes for abatement of pollution of water is mostly contractor driven with discussions being limited generally to state governments and local bodies with no meaningful involvement of the people and the community. Considering the enormity of the problem of water pollution in India and its adverse implications for the nation and the overriding need for heightening public awareness, Ministry was asked to highlight their action plan to create mass awareness and education on this issue to all sections of the population with special emphasis on students, farmers, etc. The MoEF thereupon stated that the National Ganga River Basin Authority (NGRBA) Framework has a Communication and Public Outreach Program (CPOP) involving every stakeholder including Students and Youth. The Communication and Public Outreach Plans are in furtherance of the objectives of the NGRBA Program to ensure effective abatement of pollution and conservation of river Ganga through strategic communication and enhanced public participation and outreach. The communication plan has a three tier approach- First tier at the National level, i.e., at NMCG level; Second tier at the State level, i.e., at SPMGs level and Third tier at the Executing Agencies level (including the work site). Keeping in view the wide range of opinions, concerns, and sensitivities with regard to Ganga and importance of public participation, the NGRBA framework concentrates on the following core areas of communications and public outreach:

(a) **Mass communication campaigns:** These campaigns will focus on pollution control messages, (especially 'Dos & Don'ts' of human interactions with the river) and sensitization of the general public. This will need to take in traditional material (television films, radio spots, print materials, etc) as well as innovative information dissemination media like the use of local folk media, as

well as persuasion/ outreach/ activities through NGOs, schools and colleges, temples and fairs etc.

(b) **Support for voluntary public participation:** The special space the Ganga occupies in the cultural and religious psyche of the people in India provides a tremendous opportunity for tapping this reverence and harnessing it into a people's movement. Mobilising the masses will not only generate a continuing demand for clean-up and conservation activities but will also enhance wide participation in the planning, design, implementation and, especially, monitoring of activities proposed under the Program. Community mobilisation will thus form an essential part of the Communication Strategy.

(c) **Proactive Disclosure,** such as:

i. Right to Information (RTI) compliance.
ii. Websites at NMCG and SPMGs levels.
iii. Public Information Cells at the Executive Agencies level.
iv. Information Boards/Walls at the level of the individual works at site.

(d) **Community participation**, such as:

i. Provisions for conferences, workshops, seminars at the national, state and ULB's level to bring stakeholders together for discussion, dialogue and information dissemination.
ii. Participation of community and citizens groups via ULB-level Citizens' Monitoring Committees for monitoring, feedback and social audits.

Since the World Bank assisted NGRBA Project does not cover the rural areas as of now, the rural and farmers issues are being taken care of in the Ganga River Basin Management Plan which has a communications component and is being prepared by the IIT Consortium.

14.2 The Committee were informed that Public Awareness and Participation is a must for creating social action for the river cleaning and beautification programme. It is proposed to involve the existing volunteers of Nehru Yuva Kendra Sangthan (NYKS) under the Ministry of Youth Affairs and Sports for various activities relating to this. In this context, the Committee sought to know as to why the Ministry was not focusing on targeted awareness campaigns on special groups such as 'farmers'

whose active co-operation may go a long way in reducing pollution from agricultural sources such as pesticides and fertilizers which contribute to pollution of water to a large extent. The MoEF thereupon stated that under Department of Agriculture & Cooperation (DAC)'s Central Sector Scheme "Mass Media Support to Agricultural Extension", Doordarshan and All India Radio are being utilized to make the farmers aware about modern farm technologies and researches related to agriculture and allied areas. A 30 minute programme was being telecast 5-6 days a week through National, 18 Regional Kendras and 180 High Power/Low Power Transmitters of Doordarshan. Similarly, 96 Rural FM Radio Stations of All India Radio are being utilized to broadcast 30 minutes of programme for farmers 6 days a week. For telecasting success stories, innovations and for popularization change-setting technology and farming practices through the Saturday slot of Doordarshan's National Channel, DAC is producing films, which consciously project inter-alia positive aspects in agriculture in India. A "Focused Advertisement Campaign" was launched through print as well as electronic media to create awareness about the assistance available under various schemes of the Department of Agriculture & Cooperation. The advertisements were released through national as well as regional newspapers. The audio-video spots are being broadcast/telecast through AIR, Doordarshan and Private Channels operating at national & regional Level. Under this campaign, one of the Audio-Video spots produced was on "Judicious Use of Fertilizers" and the same is being telecast through Doordarshan and private channels operating at national level during the news, and popular entertainment programmes on prime time bands to create awareness among the farmers about the benefit of using fertilizers judiciously, cultivation as well as pollution. Advertisement was published in all leading national and regional newspapers on "Use of Pesticides" to create awareness among the farmers. In addition, Ministry of Agriculture is imparting awareness to the farming communities for judicious use of agricultural chemicals in their crops through various human resource development programmes (2 days, 5 days, 30 days Season Long Training Program (SLTP) and Farmers Field Schools (FFSs) – 14 weeks – once a day in one village) under Integrated Pest Management (IPM). The Scheme is being implemented country-

wide through 31 Central Integrated Pest Management Centres (CIPMs) located in 28 States and 1 Union Territory. Since 1994, up till March 2012, the Directorate of Plant Protection, Quarantine & Storage (PPQ&S), under DAC, has organized 13991 FFSs wherein 57962 Agriculture/Horticulture Extension Officers and 4,20,720 farmers have been trained on latest IPM technology in various crops. Over 232 lakh ha. has been covered under pest monitoring and 43,543 million bio-control agents have been released for control of different pests and diseases. So far, 1871 master trainers have been trained in 51 SLTPs in different crops like Rice, Cotton, Vegetables, Groundnut, Mustard, Soybean, Gram/Tur, Chillies and Sugarcane. Also IPM package of practices for pests/diseases management in 77 major crops have been developed in collaboration with State Departments of Agriculture/Horticulture/Indian Council of Agricultural Research (ICAR) Institutions/State Agriculture Universities (SAUs) which have been circulated to all States/UTs and have been posted on Directorate of PPQ&S's Website www.dacnet.nic.in/ppin for use by the extension functionaries and the farmers. At present, there are 351 bio-control laboratories functioning in India for production of bio-control agents & bio-pesticides. These labs have been set up by different agencies viz. Central Government, State Governments, ICAR, SAUs, Department of Bio-Technology (DBT), NGOs and Private entrepreneurs. Grant in aid of ₹ 1772 lakh and ₹ 64.15 lakhs was provided to States and Non-Governmental Organizations (NGOs), respectively for setting up of bio-control laboratories in different States and UTs. Besides, ₹ 353.73 lakhs has been granted for rodent pest management in North Eastern States.

14.3 The Committee sought to know whether any effective strategy for public education, awareness and participation programme has been drawn up to seek adequate involvement of the civil society. The Ministry thereupon stated that they had been funding environmental awareness programmes involving civil society and furnished the following details :

- **National Environment Awareness Campaign (NEAC)**: The NEAC was launched in mid 1986 by the Ministry with the objective of creating environmental awareness at the national level. In this campaign, nominal financial assistance was provided to the NGOs, Schools, colleges, universities, research institutes, women and youth organizations, army units, government departments, etc. from all over the Country for conducting awareness raising and action oriented activities. Thirty four regional resource Agencies appointed by the Ministry were involved in conducting, supervising and monitoring the National Environment Awareness Campaign activities. As of now about 14000 participating agencies comprising of NGO schools are engaged in National Environment Awareness Campaign.
- **Other Awareness Programme**: Under this program, financial assistance is provided to a recognized academic/research institution or a government department/ government undertaking with at least three years of experience of working in environmental related fields. Also the proponent could be a registered voluntary/ professional organization/ Trust/ NGO with at least three years experience in environment related fields and registered under the relevant provisions for a minimum of three years and raising auditing accounts. Additionally, funds were also provided to professionals, scientists, environmentalists, other groups of the society to share knowledge and experience on various aspects of environment.
- **National Mission for Clean Ganga (NMCG) under National Ganga River Basin Authority (NGRBA)** :The knowledge-base for the Ganga system was being upgraded to ensure that planning and investments are based on adequate and sound information. It will also form the basis of a comprehensive, and revamped, communications programme to engage various stakeholders. A project proposal for setting up ‘Ganga Knowledge Centre (GKC) had been prepared by the NMCG in-house and under the process for submission before the Empowered Steering Committee of the NGRBA for approval. Public participation will be through strategic and

broad-based communications and community participation components. The aim was to build support, manage expectations and sustain public pressure to complement regulatory enforcement and investment outcomes. City level Monitoring Committees (CMCs) headed by the District Magistrate & Collector concerned were being formed for every project towns to achieve such goals.

14.4 The PAC (2003-04) in their Ganga Action Plan (GAP) Report (62nd/13th Lok Sabha) had recommended awareness drive and taking into confidence local NGOs/representatives/religious seers especially with respect to throwing of dead bodies/half burnt bodies/conduct of Jal Samadhies contributing to worst pollution in rivers especially of river 'Ganga'. On being asked about this aspect of public involvement, the MoEF stated that building on lessons from the Ganga Action Plan, the vision of the NGRBA Program marks a significant departure from the previous efforts, by adding public outreach and community participation as an important component particularly for occasions like Kumbh Melas.

14.5 On the issue of curbing the practices of dumping human excreta, Gaushala discharges, cow dung, half burnt bodies, dead bodies, animal carcasses, etc., with consequential pollution in the river, the PAC (2003-04) in their GAP Report had then exhorted the MoEF to come out with a concrete plan for an awareness campaign, even with the help of law enforcing agencies and religious seers to inculcate a scientific temper in the people along with religious point of view so that people do not become a compulsive partner in polluting the river they revere as 'holy'. The Committee in their Action Taken Report deplored the careless attitude of the Government for having treated a vexed question of raising mass awareness campaign against throwing non-cremated dead bodies in the holy river as a simple law and order problem which was to be handled by the Superindentent of Police and had desired that the Ministry should assign due priority to such an important and far reaching issue concerning certain conventional and religious beliefs. Subsequently, the MoEF in their Action Taken Statement laid in Parliament on

14.03.2008 had stated that local seers and public representatives are being persuaded in the State of Uttaranchal to create a consensus on stopping Jal Samadhies and burning of dead bodies on the banks of Ganges and Kharkhari but so far the goal was yet to be fully realized. It was also stated that in view of the erratic power supply in UP and Bihar and general reluctance to accept the electric crematorium, it has been decided to promote improved wood based crematorium. In this context, the Committee sought to know whether adequate number of wood based crematoria had been made available for use of the people, the MoEF replied that the State Governments assessed the need to install adequate number of wood based crematoria for cities/ towns and submitted proposals accordingly to the Ministry for funding of projects which were approved. Construction of Crematoria under NGRBA programme has also been given due priority as part of the 'River Front Management' sub-project. Construction of Electric Crematorium in West Bengal has also been sanctioned under the NGRBA project.

14.6 Asked how far the promotion of the use of these crematoria for cremation of dead bodies had been successful, the MoEF submitted that they fund construction of improved wood based crematoria to reduce consumption of wood and resultant destruction of forests. However, due to lack of awareness and lack of information about the need to conserve wood and adverse impact of green house gases on environment, acceptability of the improved wood based crematoria was very low.

14.7 On a further query as to whether it has resulted in any quantifiable decrease in the horrendous practice of throwing of dead bodies into the river, the MoEF stated that they have not conducted any study to know the number of bodies thrown in river over the years.

14.8 Asked whether the Ministry monitor disposal of bodies in rivers and whether any reliable statistics in this regard were being maintained, the Ministry replied in the negative.

14.9 Declared biologically dead in the 1950's, the recovery work of the River Thames in Britain resulted in rebounding its biodiversity and fisheries and its been reported that while bestowing the world's largest environmental award, the International Theiss River Prize, 2010 the consideration for which focused among others on the innovative projects put in place which included 'working with farmers, which has helped to reduce pollution from nutrients and pesticides'.

14.10 The Department related Parliamentary Standing Committee on Science and Technology, Environment and Forests in their 112th Report on Demands for Grants (2003-2004) of the MoEF presented to the Houses on 02.05.2003 had also referred to the successful cleansing of the Thames River. In this context, the Committee sought to know whether the Ministry has ever studied/ identified the thrust of the success factors which led to the cleansing of the River Thames in Britain for any possible replication thereof in the endeavours towards effective counter pollution measures. The MoEF thereupon replied that the Delhi Government through Delhi Jal Board (DJB) had studied the strategy adopted by the Thames Water Authority for cleaning the river and adopted some of the elements like interception of sewage and industrial effluent and their diversion for treatment, and upgradation of existing sewage treatment plants, etc. The Central Pollution Control Board (CPCB) too worked with the Scientists, Thames Water Authority on river Ganga for conducting some study similar to the one successfully conducted on river Thames.

14.11 Keeping in view the demonstrated success of 'working with farmers' in the cleansing of river Thames, the Committee enquired whether the Ministry have identified 'farmers' as a special focus in their Public Participation, Information, Education and Communication (IEC) activities statedly being taken up, which may have a great potential in producing effective results in containing pollution from agricultural sources. The MoEF thereupon replied that under the Department of Agriculture & Cooperation (DAC)’s Central Sector Scheme “Mass Media Support to Agricultural Extension”, Doordarshan and All India Radio are being utilized to make

the farmers aware about modern farm technologies and researches related to agriculture and allied areas.

14.12 The Committee were also informed that Ministry of Agriculture and concerned Departments are introducing best management practices so that water quality is not affected due to agricultural run off. CPCB is concerned with recipient water bodies and in that context communicated to Ministry of Agriculture for awareness of farming communities to use optimum water, fertilizers and pesticides. The MoEF further stated the Ministry of Agriculture may continue the farmers field school (FFS) and the Integrated Pest Management (IPM) in a bigger way to address the issue.

14.13 On a further query as to whether any study was being undertaken to assess the effectiveness of such awareness drive and whether it has yielded any demonstrable results, the MoEF stated that evaluation of Central Sector Scheme "Strengthening and Modernization of Pest Management Approach in India" was conducted by National Productivity Council (NPC), Chandigarh during 2005. The NPC has inter-alia suggested Integrated Pest Management (IPM) as a holistic approach for pest management/crop health management. The benefits which accrued under the scheme are as under:

a) Field based IPM training to farmers through FFSs empowered them with knowledge on Agro Eco-System (AESA) which enabled them to monitor crop pest situation and helped to raise health of crops, with low input cost on pest management;

b) IPM programme encouraged good agricultural practices by farmers including observance of waiting period thereby ensuring food safety with reference to pesticides residues, for domestic and export markets;

c) IPM programme helped in preservation of eco system and environment by reducing pollution in soil, water and air, due to limited use of chemical pesticides.

d) The Component-Implementation of IPM programme helped in assisting State Departments of Agriculture/Horticulture in pest and disease monitoring and issuing timely warning to farmers, enabling them to plan in advance actions required for pest management;

e) Improvement in capacity building and decision making ability of extention functionaries, personnel from NGOs, Krishi Vigyan Kendras (KVKs), State Agriculture Universities (SAUs), pesticide dealers, etc.

14.14 It was further submitted that at the national level, beneficial impact of IPM has been observed through the following indicators:-

i) The IPM strategy has reduced dependence on chemical pesticides for pest management. Reduction in pesticide use has been observed to an extent of 52% to 100% in Rice, 29.96% to 55% in cotton in demonstration fields conducted by the Central Integrated Pest Management Centres (CIPMCs) located in 28 States and 1 UT;

ii) Use of bio pesticides/neem based pesticides increased from 123 MT during 1994-95 to 8000 MT during 2011-12;

iii) Over all consumption of chemical pesticide in the Country has reduced from 75,033 MT (Tech. Grade) during 1990-91 to 50,583 MT (T.G.) during 2011-12.

14.15 Queried whether in actual practice, the FFSs are functional with adequate infrastructure and manpower, the MoEF stated that IPM is a component of Department of Agriculture and Cooperation's (DAC's) Scheme "Strengthening & Modernization of Pest Management Approach in India" under which FFSs are being implemented through 31 Central IPM Centres located in 28 States and 1 UT.

14.16 About the number of such schools all over the country, the MoEF replied the Directorate of Plant Protection, Quarantine & Storage (DPPQ&S) is organizing nearly 700 FFSs annually in 28 States and 1 UT. In addition, State Governments have also been organizing such schools. It was further submitted that these Schools were run by the DPPQ&S through its Central Integrated Pest Management Centres (CIPMCs). They are manned by the technical staff of CIPMCs who are Government officials. Though no teacher was appointed to run FFSs and farmers are involved in each of the FFSs and attendance is nearly 100%.

14.17 Asked about the adequacy of monitoring mechanism to ensure proper functioning of such schools, the MoEF replied in the affirmative and stated that the activities of FFSs run by CIPMs are monitored by the DPPQ&S, Faridabad.

14.18 The Department related Parliamentary Standing Committee on Science and Technology, Environment and Forests in their 112th Report on Demands for Grants (2003-2004) of the MoEF presented to Parliament on 02.05.2003 had also recommended that the thirteen prohibitive actions contained in the Bramhanda Purna of the Hindu Mythology to maintain the purity of the Ganges can be incorporated by the Ministry in their norms for prohibiting activities to keep the river clean. Para 39 of the aforesaid Report is reproduced below :

> "Our rivers have been revered throughout ages. Our tradition invested divinity with our rivers. Pages of our mythologies show as to how norms were prescribed to keep the water of the Ganges clean. The Committee observed that the Bramhanda Purna prohibited thirteen actions to maintain the purity of the Ganges. Some of these are (i) defecations (ii) ablutions (iii) discharge of waste water (v) throwing of used floral offerings (v) rubbing of filth (vi) body shampooing (vii) frolicking (viii) acceptance of donations into the rivers (ix) obscenity (x) discarding or cleaning of garments (xi) beating and swimming across. The Committee recommends that many of these can be incorporated by the Ministry in their norms for prohibiting activities to keep the Ganges clean."

14.19 In this context, MoEF was asked to state whether any serious consideration has been given to the recommendations towards making a reference of the Bramhanda Purna which may have immense potential in dissuading people from indulging in

religious practices leading to considerable pollution of the river, the Ministry replied that National Mission Clean Ganga (NMCG) has taken this as an important reference and it is part of the NMCG's communications and public outreach campaign for during Kumbh mela.

14.20 On the steps being taken/ proposed by MoEF to disseminate the information regarding industries/ factories polluting water bodies, amongst general public, the MoEF stated that Central Pollution Control Board (CPCB) was conducting various studies for assessment and control of pollution caused by industrial sources. The assessment reports, action taken report, directions issued to industries under the Water (Prevention and Control of Pollution) Act, 1974 and Environment (Protection) Act, 1986 was posted on the website of Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs) for dissemination and information of general public.

14.21 On a pointed query as to whether the data on such polluting industries/ factories would be available in public domain, the MoEF stated that Central Pollution Control Board (CPCB) has been conducting various studies for assessment and control of pollution caused by industrial sources. The assessment reports, action taken report, directions issued to industries under the Water (Prevention and Control of Pollution) Act 1974 and Environment (Protection) Act 1986 is posted on the website of the Central Pollution Control Board and the State Pollution Control Boards for dissemination.

14.22 The Road Map brought out by the MoEF for 'Management of Water Pollution in India' specifically mentions consultations at the stage of formulation and implementation of projects to ensure active involvement of various stakeholders and the civil society to generate support and encourage ownership. The Road Map recognises that effective civil society / public participation can only bring about full success of the programme. As per the revised guidelines, it is necessary to formulate an effective public education, awareness and participation programme as part of DPR so as to make the projects socially acceptable. An expert agency with

right kind of background and experience may be engaged to formulate Public Participation strategy. Two types of outcomes are expected from this activity. The first one is public participation and through it agreement on complex issues like house connections, water conservation at household levels, proper collection of garbage so that it does not choke sewers/drains, sharing increased burden of O&M cost, proper layout of sewerage systems and location of STPs, diffusing conflicts, if any, on programme components, etc. This can be best achieved through consultation at various stages of project formulation and implementation. The second one is increasing public understanding about the programmes through awareness. This should be achieved through workshops, seminars, street plays, city runs and riverside walks. Active involvement of students and teachers community in schools and colleges can greatly help in achieving the objectives. Public can also play the role of a watchdog in supervising project implementation and operation and maintenance which would help improve the quality of the programme. Emphasis may be placed on increasing public participation under NGRBA. Apart from hiring expert agencies for this purpose, arrangements to involve Nehru Yuva Kendra Sangathan have been put in place, which should be integrated with this component.

14.23 The Department Related Parliamentary Standing Committee on Science and Technology, Environment and Forests in their 224th Report on Demands for Grants (2012-13) presented to the Parliament on 18.5.2012 in Para 11.4 observed that a huge investment incurred under various schemes/projects, pollution level in both the rivers i.e. the Ganga and the Yamuna continues to increase unabated, with the condition of Yamuna, virtually turned into a 'Nala' to carry sewage falling into it from various drains and water quality of the Ganga having not shown any significant improvement either and continues to be a major concern for the environmentalist, as well as, the common man.

14.24 **Significance of rivers and water bodies in Indian scriptures**

The Indian scriptures attach great importance to the rivers and water bodies. The rivers occupy an exalted position elevating them to divinity. A hymn in the 'Rig Veda' reads:

"ljLorh lj;q% flU/kq:feZfHkeZgks eghjolk ;Urq of{k.kh%A
nsohjkiks ekrj% lwnf;Uroks ?k`roRi;ks e/kqeUuks vpZrAA"(Nadya Sukta 10.75).

"The River Hym of the Rig Veda invokes twenty-one rivers of the Indian peninsula to join in the sacred oblations as the protectors of humankind. The seers describe the rivers as mothers, their inspirations and the bestowers of water filled with 'butter and honey' ".

There are hymns in the Atharva Veda in praise of streams. For example:

vEc;ks ;UR;/ofHktkZe;ks v/ojh;rke~A
i`aprheZ/kquk Ik;%AA(I.4.1)

"As mothers always bring happiness to their children, in the same manner,
The streams, nourishers of mankind, flow incessantly, adding milk and honey to their waters all the way".

vew;kZ mi lw;sZ ;kfHkokZ lw;Z% lgA
rk uks fgUoURo/oje~AA(I.4.2)

"May these steams of water which are contiguous to the Sun (in the sense that water is carried away by rays) and those waters with which the Sun is associated, be propitious to our sacred work and worship."

vILo Urje`reIlq Hks"kte~A
vikeqr iz'kfLrfHkj'ok HkoFk okftuks xkoks HkoFk okftuh%AA(I.4.4)

"O learned persons, may you know that there is ambrosia in the waters; there is healing balm in them, and there are medicinal herbs; know this, and by their proper use become vigorous like horses and kine."

vkiks fg "Bk e;ksHkqoLrk u ÅtsZ n/kkruA

egs j.kk; p{klsAA(I.5.1)

"Since, waters, you are the source of happiness, grant to us energy giving food, and an insight to enjoy your divine splendour"

rLek vja xeke oks ;L; {k;k; ftUoFkA
vkiks tu;Fkk p u% AA(I.5.3)

"May we, O waters, quickly come to you for food, shelter and procreant strength which you are always pleased to bestow upon us".

bZ'kkuk ok;kZ.kka {k;Urh'o"kZ.khuke~A
viks ;kpkfe Hks"kte~AA(I.5.4)

"O waters, sovereigns of precious treasures, and granters of habitations men, I solicit of you medicine (for the cure of my infirmities".

'ka uks nsohjfHk"V; vkiks HkoUrq ihr;sA
'ka ;ksjfHk lzoUrq u%AA(I.6.1)

"May the divine waters be propitious to us, for the fulfillment of desires, and for our drinking. Let them shower on us joy and fearlessness".

vIlq es lkseksa vczohnUrfoZ'okfu Hks"ktkA
vfXua p fo'o'kEHkqoe~AA(I.6.2)

"Wise men have acclaimed that within the waters dwell all balms that heal,
The waters contain all the healing herbs, and also the fire, the benefactor of the universe".

vki% i`.khr Hks"kta o:Fka rUos… eeA
T;ksDp lw;Za n`'ksAA(I.6.3)

"Waters, bring to perfection all disease-dispelling medicaments for the up-keep of my body, so that I may live long to see the bright sun".

'ka u vkiks /kUoU;k…% 'keq
lURouwI;k%A
'ka Uk% Lofuf=ek vki% 'keq ;k% dqEHk vkHk`rk% f'kok
u% lUrq okf"kZdh%AA(I.6.4)

"May the waters of desert be for our well-being; also for well-being the waters of the low lands. May the waters dug out from earth be for our well-being; also be beneficial for us (joy-giving to us".

f'kosu ek p{kq"kk Ik';rki% f'ko;k rUoksi Li`'kr Rops esA
?k`r'oqr% 'kqp;ks ;k% ikodkLrk u vki% 'ka L;ksuk
HkoUrqAA(I.33.4)

"O elemental waters, may you behold me with an auspicious glance; may you touch my skin with your body. Dripping luster, glittering here and that are purifying, may those elemental waters be gracious and pleasing to us".

;s fdze;% ioZrs"kq ous"oks"k/kh"kq
lk'kq"oILofƒUr%A
;s vLekda rUo ekfofo'kq% loZa r)fUe tfue
fdzeh.kke~AA(II.31.5)

"The worms, that are found in the hilly regions, in the forests, inside the animals and in waters, and that have entered our bodies, I hereby destroy their entire generation".

bek vki% iz HkjkE;;{ek ;{euk'kuh%A
x`gkuqi iz lhnkE;e`rsu lgkfXuukAA(III.12.9)

"I bring here these waters, free from wasteful disease (consumption) and destroyers of the wasteful disease. I enter these houses with the never-dying fire".

The Yajurveda also refers to the blessings of potable Water :

'kUuks nsohjHkh"V; vkiks HkoUrq ihr;s]

'ka;ksj fHklzoUrq u%A(36/12)

"May this divine water be the bestower of ultimate bliss and may it be potable. May it shower happiness on us".

14.25 Another later composition, the strotra 'Ratnavali' also celebrates 'blessed waters' of the river Ganga.

Ukekfe xaxs ro ikn idte~]
Lkqjklqj cfUnr fnC;:ie~]
eqfDre~ p HkqfDre~ p nnkfl fuR;e~]
Hkkokuqlkjs.k lnk ujk.kke~AA

"O Ganga, I bow to your lotus feet, the gods and the demons worship your divine manifestation;
Eternally, You are provider of liberation and satiety according to the desire ('bhava') of human beings".

14.26 The Department related Parliamentary Standing Committee on Science and Technology, Environment and Forests in their 112th Report, laid in Parliament on 2nd May, 2003, observes:

"Our rivers have been revered throughout ages. Our tradition invested divinity with our rivers. Pages of our mythologies show as to how norms were prescribed to keep the water of the Ganges clean. The Committee observed that the Bramhada Purna prohibited thirteen actions to maintain the purity of the Ganges. Some of these are (i) defecations (ii) ablutions (iii) discharge of waste water (iv) throwing of used floral offerings (v) rubbing of filth (vi) body shampooing (vii) frolicking (viii) acceptance of donations into the rivers (ix) obscenity (x) discarding or cleaning of garments (xi) beating and swimming across".

CHAPTER – XV

OBSERVATIONS/RECOMMENDATIONS

1. <u>Need for introspection and recognizing water as a finite and vulnerable resource</u>: The Committee note that water remains the basis of all life. Undoubtedly, access to safe, clear and adequate fresh water is vital to the survival of all organisms and the smooth functioning of key systems, entities and economies. Prevention of Water pollution has been a matter of deep concern with the Committee. The Committee in their 62nd Report had emphasised *inter-alia,* on institution of urgent measures to accelerate the pace of work on control of pollution and concurred with the 'beneficiaries pay' and 'polluters pay' principles. The Committee are deeply dismayed to note that despite their wide ranging recommendations made earlier, water pollution has reached alarming proportion in most of the rivers/water bodies. The Stakeholders' Conference on Environment Audit held in July, 2009 flagged water pollution as the most important environmental issue. The C&AG conducted a comprehensive Performance Audit of Water Pollution in India during 2010-11. Audit examined 140 projects across 24 polluted stretches of rivers, 22 lakes and 116 blocks across 25 states of India. The Audit findings reveal certain very disquieting aspects which *inter-alia* include inadequacies in the Legislative, Policy and Institutional framework; gross deficiencies in the planning for control of pollution of rivers, lakes and groundwater with incomplete inventorisation of rivers/lakes and keystone species associated with them and non-identification of existing pollution levels, quantification of contaminants, etc; unsatisfactory performance and shortfalls in the implementation of programmes such as National River Conservation Programme (NRCP) and National Lake Conservation Programme (NLCP). Notably, Water pollution in the 14 major and 55 minor and several hundreds more rivers of India remains a serious problem with millions of litres of sewage, industrial and agricultural waste discharged into these rivers with a mere 10% of such waste water generated being treated, presently. Worse, lakes and ground water are

under severe threat from the impact of pollution. Though the Committee's examination of the various aspects of the subject is discussed separately in detail and commented upon in the preceding Chapters, the Committee are of the considered view that the rather disquieting audit revelations call for serious reintrospection at the highest level in the Government. While upholding the principles of sustainable development, necessary for sustenance of life, the precautionary principle and polluter pays principle in environmental management, the Committee ardently urge the Government to recognise 'freshwater' as a finite and vulnerable resource and demonstrate their unwavering commitment to combat and control water pollution and supply minimum potable water to all free of cost.

2. Heightening awareness of students : The Committee are happy to note that their initiative to seek public views from all over the Country inviting suggestions on 'Prevention of Water Pollution in India' *received a heartening response.* The Committee note the profound concern of the citizens over water pollution and mounting water scarcity across the country. Considering the significance and paramount importance of Public Awareness, Community Involvement and Participation in tackling the issue of water pollution, the Committee's findings, observations and recommendations on this important aspect have been enumerated in Chapter XIV of this Report. The Committee are, however, particularly happy to observe that the Ministry of Human Resources (Department of School Education and Literacy) have taken some initiatives to sensitise impressionable minds of students on environmental issues including the need for prevention of water pollution as enumerated in their Detailed Note reproduced in Annexure II of the Report. However, much more needs to be done on a sustained basis to build and disseminate awareness right from the primary school level. The fundamental duties of citizens as enshrined in our Constitution particularly one for protection of the environment further needs to be highlighted. The Committee therefore recommend that :-

(i) **The existing initiatives to sensitise students and the general public on prevention of water pollution and other environmental issues be further strengthened keeping in view the fundamental duty of every citizen to protect and improve the natural environment including forests, lakes and wild life;**

(ii) **Appropriate Teachers Orientation Programmes be designed and regular training imparted to the teachers; and**

(iii) **The area specific hazards of water pollution, whether surface or ground water, be publicised regularly and widely and useful devices/techniques to deal with such hazards, area-wise, be made known to the people.**

The Committee may be apprised of the action taken in the matter.

3. Need for National consensus on Water : The Committee note that the Directive Principles of State Policy enshrined in article 48A of the Constitution enjoins upon the State to make endeavour for protection and improvement of the environment. Article 51A(g) casts an obligation upon every citizen of India to protect and improve the natural environment. The Committee are, however, deeply dismayed that water pollution remains the largest and mounting environmental hazard. The Committee are deeply concerned to note that the preparation of Water Quality Management (WQM) Plan by the State Governments in accordance with the guidelines circulated by the MoEF is hanging fire as 'Water' is a State subject (Entry 17, List II, 7th Schedule). Further, the 73rd and 74th amendments to the Constitution endowing the Panchayats and Municipalities with the responsibility of management of water and sanitation have diluted the power of States as the Pollution Control Boards are not equipped with any Constitutional/Legal provisions to take action against local authorities in cases of non compliance/non enforcement with respect to Water Pollution. The Committee observe that this dichotomy needs to be addressed urgently to bring about distinct clarity on the role and responsibilities of various authorities for

prevention of water pollution and environmental degradation. In this context, the Committee also note that the Departmentally Related Parliamentary Standing Committee on Water Resources in their 10th Report of 15th Lok Sabha had stressed on the need to build national consensus to bring 'water' either in the Union List or in the Concurrent List. The National Water Policy, 2012 recognizes the rights of the States to frame suitable policies, laws and regulation on water and also emphasized on the need to evolve a broad over-arching national legal framework of general principles on water. The Committee concur with the recommendation of the DRSC on Water Resources and urge the Government to take urgent action to set the stage for enactment of a comprehensive national legislation on water after evolving a broad national consensus to bring water in the Concurrent list and formulate an over-arching national legal framework for effective water management, conservation, development and equitable distribution with adequate provisions for devolution of necessary authority to the lower tiers of government. The fundamental duties of citizens to protect and improve the natural environment including forests, lakes, rivers etc. may be well dessiminated and public awareness built.

4. Implementation of the Road Map : The Committee observe with profound concern that though the Water (Prevention and Control of Pollution) Act, 1974 is in place, the law neither specifically identifies pollution as an environmental offence nor address the restoration of water bodies as a priority action. Further, the existing legislations relating to control and prevention of water pollution *viz.* the Water (Prevention and Control of Pollution) Act, 1974, the Water Prevention and Control of Pollution) Cess Act, 1977 and the Environment (Protection) Act, 1986 fall short of in many vital aspects including enforcing compliance in cases of violation. Needless to say, a strong, comprehensive and vibrant legal framework with a strict enforcement regime is a dire necessity for effective water quality protection and pollution prevention. The Committee also note that consequent to the Audit Report, an expert Committee, constituted by the MoEF in

consultation with the Planning Commission, has brought out a Road Map for prevention of Water Pollution in India for implementation of the recommendations/observations made in the Audit Report within the existing legal and Constitutional framework. The Road Map recommends an amendment to the Environment (Protection Act), 1986 to address various important issues in environmental management viz. hike in penalties for contravention of its provisions; a civil administrative adjudication system to ensure fast-tracking of the imposition of penalties on environmental offenders; provision for furnishing suitable bank guarantees for specific performance and for restoration of damaged environment; establishment of a National Environmental Appraisal and Monitoring Authority (NAEMA) to carry out environmental appraisals and monitoring of compliance conditions. The Committee are dismayed to note that no tangible action has been initiated to implement the Road Map for prevention and control of water pollution and effective environmental management. The Committee therefore recommend that urgent and time bound action be taken to implement the Road Map and the Committee apprised in due course. Further, the Committee recommend that action be also taken for sustained involvement of enlightened citizens, farmers, youth, NGOs, academicians and the public to keep an effective and unremitting vigil on pollution of water bodies; more transparency in inspection, prosecution and closure of sources of pollution; appropriate monitoring mechanisms for checking inter-state movement of water pollution; technological support for monitoring water quality in addition to disseminate awareness about indigenous methods and techniques used by local fisherman and farmers; stringent monitoring of hot spots with emphasis on drinking water intake points; etc.

5. Comprehensive review of Legislation : The Committee note that the two major pollutants of rivers and lakes across the country are sewage and industrial effluents. Against an estimated sewage generation of about 38254 MLD from only class I Cities and class II Towns of the Country, the available treatment capacity

is for a mere 11787 MLD sewage. Worse, nearly 39% of sewage treatment plants do not conform to the effluent discharge standards prescribed under the Environment (Protection) Rules for discharge into streams. Admittedly, inadequate resources coupled with growing population with proportionate increase in sewage generation as well as acute shortage of trained manpower and poor technology hinders total sewage collection and treatment facility in almost every town/city of the Country. The Committee were apprised that a two pronged strategy, one financial incentive and two, legislative support through creation of an exclusive financial institution to cater to ever increasing demand of funds for funding high cost sewerage and industrial pollution control related projects; private participation to face the challenge of sewage collection and its treatment; and a national level designated single agency to deal with sanitation sector are being considered as part of the major reforms in this sector. Keeping in view serious structural lacunae and weaknesses in the legislative framework, the Committee recommend :

(i) A comprehensive review of all existing legislations be carried for creation of a consolidated legislative framework to address the critical challenges being faced in the control of pollution of water both point and non-point sources expeditiously in a time bound manner;

(ii) Separation of sewers and rivers so as to ban sewage treatment at the mouth of rivers and consequent discharge of treated sewage waste into water bodies and diversion of such waste for agriculture/horticulture/other suitable uses;

(iii) Creation of exclusive financial institution to cater to ever increasing demand for funds for funding high costs sewerage and industrial pollution control related projects;

(iv) Financial incentives viz. Tax benefits/subsidies/market support for sewage waste/incentives for PPP Models;

(v) Speedy establishment of a National Environmental Appraisal and Monitoring Authority (NEAMA) through appropriate enactments as envisaged in the Road Map;

(vi) Appropriate legal interventions for increasing the number of benches of the National Green Tribunal with specific benches for trial of pollution related cases as well as establishment of an alternate civil administrative adjudication system, as already envisaged, to ensure fast tracking of water pollution related cases; economic instruments for pollution control compliance; technological support for constant upgradation of pollution control devices etc; and

(vii) Appropriate and effective legal provisions for enabling active involvement of the Civil Society in the prevention and control of pollution of water through partnership models for monitoring and surveillance, establishment of Citizens Ombudsmen, etc.

6. Stringent penal provision for water pollution needed : The Committee are startled to observe that the maximum penalty/fine in case of water pollution as prescribed under the Water Act of 1974 is limited to a mere ₹ 10,000/-. Apparently, such an undeterring penalty provision coupled with a highly tolerant inspection regime of the State Pollution Control Boards (SPCBs) encourages defiance, non-adherence and violations rather than compliance of the law. Admittedly, a proposal for enhancing the minimum penalty from ₹ 10,000 to ₹ 1,00,000 for violation of the Water Act, 1974 and the Environment (Protection) Act, 1986 without amending the provisions for imprisonment with maximum penalty upto ₹ 10 crore was under consideration. Water being a State subject, the Central Government by Ministry's own admission, can only supplement the

efforts of the State Governments and the initiative for enhancing penalties has to come eventually from the States. The Committee further find that as per the provisions of sections 25/26 of the Water Act, 1974, no industry or treatment disposal system can be established without the previous consent of the State Pollution Control Board and discharge of sewage or trade effluents in excess of the standards prescribed is punishable with imprisonment upto six years alongwith fine. Admittedly, section 33A of the Water Act for initiating penal action for water pollution was effective only for industries and has not worked well in the domestic sector as well as for local authorities, with the transfer of subject of sanitation to the local bodies *vide* the 73rd and 74th amendments to the Constitution. The only option left of taking local authorities to the courts for non-compliance is undoubtedly, a tedious and time consuming process. Notably, other options like enhancing costs are being explored. While acknowledging that calculating damage costs of environment remains a very complicated matter as futuristic cost elements have also to be taken, the Committee observe that only mere levy of damage costs by way of enhancing penalties may not as such become an effective deterrent. The dismal number of inspections, totalling to a mere 857, carried out by the Environmental Surveillance Squad (ESS) of Central Pollution Control Board (CPCB) in last three years (2009-2012) on 1055 grossly polluting industries in the Country generating as much as 9982 MLD effluents reveals the weaknesses in the enforcement regime for pollution of water vis-a-vis the quantum of pollutants generated. Compared to this, the total number of Courts cases filed under the Water Act as on 30.06.2012 stood at a fair 6320, also indicative of the large number of violations taking place all over the country. The Committee further note that, directions issued under sections 5 and 18(1)(b) of the Water Act, 1974 during the last 3 years (2009-2012) totalling to 118 and 195 respectively included 7 directions issued to NGRBA under section 18(1)(b) of the Act. <u>The Committee therefor recommend that :</u>

(i) <u>The proposal for enhancing the minimum penalty from ₹ 10,000 to ₹ 1,00,000 for violation of the Water Act, 1974 and the Environment</u>

(Protection) Act, 1986 without amending the provisions for imprisonment with maximum penalty upto ₹ 10 crore be implemented expeditiously;

(ii) Other options for ensuring compliance to non polluting norms by the domestic sectors as well as for local authorities may also be explored;

(iii) A robust water inspection regime be put in place with inbuilt provisions for mandated periodic as well as surprise checks by an empowered and well-equipped inspection team to detect and report all cases of violation of norms; and

(iv) Adequate funds be provided by the Union and the State Governments for this purpose and the necessary manpower be trained to work in this regime.

7. Implementation of National Water Policy : The Committee observe that the National Water Policy was adopted in 1987, reviewed in 2002 and updated in 2012. Further, the National Conservation Strategy and Policy Statement on Environment and the National Environment Policy were formulated in 1992 and 2006. These documents form the broad policy framework of environmental issues placing the addressal of water pollution as one of the thrust areas. The Committee observe with serious concern that while only 18 States have framed Water Policy, most of them do not give adequate emphasis to Prevention and Control of Water Pollution except the State Government of Kerala which seeks to address water pollution issues. Notably, 14 States have already enacted the Ground Water Bill and another 16 States have taken initiatives for enactment of such a Bill based on the Model Bill circulated to the States/Union Territories for Regulation and Control of Ground Water Development and Management. The Committee further find that as regards policy framework, the Road Map for 'Management of Water Pollution in India' prepared by the MoEF in consultation with the line Ministries addresses various important issues in environmental

management *viz.* hike in the penalties for contravention of its provision, a civil administrative adjudication system to ensure fast tracking of the imposition of penalties for environmental offenders; proposal to establish a National Environmental Appraisal and Monitoring Authority (NAEMA) to carry out environmental appraisals and monitoring of compliance conditions; setting up of Bureau of Water Efficiency (BWE) under the Water Resources Ministry; legal entity status to common effluent treatment plants to facilitate investments and enable enforcement of standards; encouragement of Integrated Pest Management (IPM) and use of biodegradable pesticides as also explicit accounting of groundwater pollution in pricing policies of agricultural inputs; establishment of bio-conservative zone around water body; integrated water resources management, etc. Taking note of the laudable objectives of the National Water Policy, 2012, the Committee recommend :

(i) The National Water Board urgently prepare a plan of action for regularly monitoring of implementation of the National Water Policy, 2012;

(ii) Appropriate and sustained steps may be taken to encourage all the States to formulate clear water Policies with special thrust on prevention and control of water pollution including ground water as well as ecological restoration of degraded water bodies, as also reorientation of development policy of the States (as already done by the State of Kerala) in accord with the objective of the National Water Policy 2012 and the National Environment Policy 1992;

(iii) Mandatory periodic review be made of the implementation of various policies relevant to the issue of water pollution, environmental conservation and findings thereof publicly disclosed ; and

(vi) The proposals rolled out in the Road Map pertaining to policy framework be implemented in right earnest to achieve the stated objectives within the

given time frame and the Committee apprised.

(vii) An inventory of all water bodies including rivers, lakes, ponds, streams, wells, etc. be made and digitalised within a time bound programme.

8. Identification of systemic deficiencies and need for greater synergy between CPCB and SPCBs : The Committee note that the policy making responsibility for preventing pollution of rivers/lakes rests with the Ministry of Environment and Forests (MoEF) and Central Pollution Control Board (CPCB) and the Central Ground Water Board (CGWB) in the Ministry of Water Resources (MoWR). Implementation of these policy measures rests with the National River Conservation Directorate (NRCD) for River/Lake Pollution and MoEF and MoWR for Ground Water; and for monitoring of river/lake pollution, the designated authorities are NRCD/CPCB and for ground water pollution, its CGWB and the Water Quality Assessment Authority (WQAA). The Committee further observe that in most States, the responsibility of control of water pollution has been assigned to the State Pollution Control Boards (SPCBs). Surprisingly, beside a multitude of authorities, the Committee note sheer want of functional co-relation between them especially between the CPCB and SPCBs. The Committee are appalled to find glaring systemic weaknesses and deficiencies like lack of trained manpower; acute need for cleaner technologies for treating waste; lack of adequate number of laboratories for water quality monitoring, grossly inadequate funding; inadequate infrastructure facilities; virtual non-existence of linkages with technical experts such as from IITs; grossly inadequate staffing for inspection by SPCBs; etc. which have undoubtedly affected the performance of these existing institutions. The Committee therefore would like to be apprised of the strategies being put in place to address the deficiencies, bottlenecks and weaknesses in the extant water pollution control and prevention programme. They further recommend that :

(i) A comprehensive review of the present institutional set up be carried out

to rectify existing lacunae so that the various agencies work in tandem with complete synergy or an apex lead agency be set up with powers of enforcement;

(ii) Major reforms under consideration for capacity augmentation and strengthening of existing institutions for optimum utilisation through adequate resource funding, addressing infrastructural and trained manpower constraints be implemented within a time bound programme;

(iii) Initiatives already stated to be in process may be implemented in a time bound manner to yield the desired positive outcomes; and

(iv) Linkages be established with premier third party agencies like IITs/Research Institutes/ Universities/Experts for a holistic, multi-disciplinary approach for application of best available techniques to give greater impetus to the national drive for water pollution control.

9. Enforcement of uniform Water Quality Monitoring Regime : The Committee are dismayed to find that the Water Quality Assessment Authority (WQAA), mandated to direct agencies to standardize water quality monitoring methods, ensure proper treatment of waste water to restore water quality of both surface and ground water, take up R&D activity related to water quality management and promote recycling and reuse of treated waste water, had issued only Uniform Monitoring Protocol (UMP) in 2005. Though a Task Force had recommended for development of Water Quality Data Information System (WQDIS) for coordinated collection, use and dissemination of data and review of water quality monitoring network, etc, WQAA was yet to take action for promoting recycling or re-use of sewage/industrial effluents, drawing up action plans for quality improvements in water bodies, schemes for restriction of water abstraction, reviewing the status of natural water resources, identifying hotspots, etc. The Committee are distressed to note that Water Quality Review Committees (WQRCs), though

constituted in 17 States as of March, 2013, they were largely inactive. Regular meetings of WQRCs were held only in Maharashtra and Himachal Pradesh. Worse, audit pointed that the Water Quality Assessment Authority had only seven meetings since its inception in 2001. Admittedly, water quality monitoring was being presently carried out at 1700 locations under the Natural Water Quality Monitoring Programme (NWQMP) carried out by the Central Pollution Control Board /State Pollution control Boards in addition to Groundwater quality monitoring being carried out at 15,000 stations mostly in rural areas by Central Ground Water Board and polluted river stretches/water bodies identified. The Committee are appalled to note the alarming increase in polluted stretches from 10 in 1988-89, 37 in 1992 and exponentially to 150 in 2010. Statedly, WQAA is pursuing with State Governments to prepare Water Quality Management Plan for each and every State with necessary guidelines already in circulation besides implementation of the National Lake Conservation Plan (NLCP) since June 2001 for treatment/rejuvenation of polluted/degraded lakes through an integrated ecosystem approach. The Committee note that 62 lakes have already been identified across the Country for conservation, though the Government have not indicated how many lakes are there in the Country. The Committee however, deplore that WQAA has miserably failed to discharge the onerous mandate given to it. Further, to their deep dismay, none of the States have prepared Water Quality Management Plan despite guidelines issued by the WQAA. The Committee are, however, pleased to note the elaborate monitoring of water quality network done by CPCB at 1429 stations covering 293 rivers, 94 lakes, 9 tanks, 41 ponds, 15 creeks/sea water on the basis of 64 parameters analyzed from water samples collected from these water bodies, in accordance with the objectives of water quality monitoring set out in the Road Map. The Road Map further envisages enhancing the scope and coverage of water quality monitoring needs by way of increasing the number of monitoring stations (though without indicating how many are needed), its automation and parameters and recommends, *inter-alia,* compilation of the status of pollution of all major/minor Rivers and their tributaries and lakes/wetlands to be updated every 2 years which

will form the basis for initiating action for the abatement of pollution of water bodies; formulation of a set of Standardized Service Local Benchmarks (SLBMs) for Urban Water Supply and Sanitation (UWSS) as per International Best Practices by MoUD already in circulation to all the States for adoption in infrastructure development projects; compilation of a report on the status of pollution of ground water sources in the country; selection of locations for drawing samples as per the uniform protocol on WQM Orders, 2005; allocation of a minimum 10% of project funds for water quality monitoring programmes; inclusion of specialized parameters like heavy metals, pesticides for better source identification besides biological indicators for establishing causes of pollution etc. Keeping in view the mandate of WQAA to enforce a uniform water quality monitoring practices all over the Country which, undoubtedly, is the *sine qua non* of any effective water quality monitoring regime, the Committee recommend :

(i) Overhauling and revamping of the WQAA as well as WQRCs constituted in the States so that they meet regularly and periodically and discharge their functions effectively and efficiently;

(ii) The WQAA may be made an empowered apex regulatory body to set standards in water quality monitoring and enforce compliance of such standards; and

(iii) A comprehensive, issue-wise implementation status of the objectives of Water Quality Monitoring set out in the Road Map be submitted to the Committee within six months of the presentation of this report.

10. Need for Lead Coordinating agency : The Committee note that considering the inter-State and inter Ministerial nature of the issue of water pollution, a proposal is under consideration for constitution of a lead coordinating body within the Planning Commission itself as an agency for implementation of the Road Map drawn up subsequent to the Audit Report. Statedly, the proposal is at

the conceptual stage and being discussed for consensus with various stakeholders for formulation of a concrete proposal in this regard. The Committee hope the constitution of such a lead coordinating body within the Planning Commission would ensure that institutions working for a common independent cause do not work in silos and that there is far greater and effective synergy between the Union and the States and the Departments inter-se. The Committee would like to be apprised of the outcome within six months after the presentation of this report.

11. Integration of sewage treatment programmes : The Committee note that city sewage and industrial waste discharge constitute the major water polluting sources for rivers as only about 10 percent of the waste water generated is treated, leaving the rest untreated waste discharged as it is into the water bodies. One of the major constraints, water being a State subject, major responsibility for sewerage facilities rests with the State Governments and the MoEF only supplements their efforts. By the year 2025, it is estimated that the sewage generated would be 4100 MLD and taking into account the extant sewerage treatment capacity and the capacity of 700 MLD to be created, there would be untreated sewerage of about 2200 MLD. This would need huge investment as estimated by the High Powered Expert Committee (HPEC) on Urban Infrastructure and Services. Therefore, there is an imperative need for creation of an exclusive financial institution like NABARD. Such a body could be tasked with the responsibility of creating civic infrastructure in towns and cities with equity participation of Centre, States, ULBs and the public; obtaining external assistance from bilateral and unilateral agencies through a mix of equity and debt; mobilization of funds from private sector banks/financial institutions; enhancing capacities of municipalities for recovery of user charges of water and sewage system; etc. The Committee further observe that 'sanitation' being a State subject, National Urban Sanitation Policy (NUSP) remained a model policy for the States to prepare their own sanitation strategies despite being in existence since 2008. By the Ministry's own admission, the current dismal state

in the sewage treatment capacity is reflected with a total available 11,788 million litres as against production of 38,250 million litres a day of domestic sewage including commercial and agricultural run off in class I and class II towns and cities excluding industries, as per the latest 2010 data. Further, of the one-third treatment capacity, 30 to 40 percent Sewage Treatment Plants are not working optimally due to mechanical as well as management failures. Statedly, under the World Bank funded Mission for Clean Ganga, proposals to execute projects on PPP models to ensure 100% sewage collection straight from the houses rather than interception and diversion under the City Sanitation Plan are being considered. Besides, dovetailing of sewage treatment schemes and municipal solid waste management with a reform oriented agenda is also being considered under the two components of JNNURM namely Urban Infrastructure and Governance (UIG) and Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT). The Committee however observe that though the Central Sanctioning and Monitoring Committee (CSMC) under the Chairmanship of Secretary (UD) with members from various Ministries including MoEF approves and sanctions projects under JNNURM in consultation with appropriate Pollution Control Authority, the actual implementation of the projects is done by the State Governments/ULBs though monitored by MoUD. The Committee find that the Road Map, emphasizes on a time bound action plan to ensure 100% sewage treatment by State Governments/ULBs. Notably, the Road Map implementation would involve concerted action by the Planning Commission in consultation with the Ministry of Finance through capacity building of SPCBs and CPCB. The Road Map recommends stepping up of allocation under JNNURM policy for rational use of water in recognition of the fact that water bodies should have enough water for dilution in order to take care of effluents discharged after treatment and to sustain its self cleansing process. The Road Map also contemplates monitoring by independent water Regulators and comprehensive action plan for abatement of identified polluted stretches in synchronization with ongoing programmes. The Committee further observe that given the right technical inputs and adequate resource funding, the STPs can

help generate electricity apart from neutralising the toxicity of the sewage. The Committee also note that 23 Treatment Storage Disposal Facility (TSDF) which have been set up all over the Country, taking care of large industrial estates and as far as solid toxic and hazardous residues are concerned, they are being properly managed. Taking cognizance of the single biggest hurdle in the control of water pollution viz. untreated sewage and industrial effluents discharged into water bodies with treated waste water constituting 10%, the Committee recommend:-

(i) Integration of extant sewage treatment schemes under water pollution control programmes of NRCD/NRCP with those of municipal solid waste management under the two components of JNNURM namely UIG and UIDSSM as envisaged in the Road Map;

(ii) More robust monitoring and effective coordination by the National Steering Committee for effective implementation by State Governments/ULBs of sewage Projects sanctioned under JNNURM;

(iii) 100% sewage treatment by State Governments/ULBs be implemented in right earnest;

(iv) Appropriate and earnest efforts be made to extend 100% financial support for sewerage treatment plants;

(v) More stringent rules be made for disposal of solid toxic and hazardous waste and rigorous monitoring and also to ensure that facilities processing such wastes are maintained all year round for optimum efficiency;

(vi) A sustainable solution of cost recovery as well as cost sharing for sewerage collection, treatment and disposal through stringent regulatory norms relying on appropriate combination of fiats and incentives be worked out so that such costs are equitably distributed amongst all

citizens based on the principles of 'polluters pay' and 'beneficiaries pay' to ensure optimum use of water;

(vii) Aggressive awareness/sensitization programmes be launched on sustained basis aiming at educating the public about sharing the cost of treatment of sewage generated by them by highlighting the direct and indirect benefits there-from; and

(viii) Proactive and concerted efforts be made by the Union Government to encourage all the States to prepare their own sanitation strategies in harmony with the National Urban Sanitation Policy (NUSP), 2008 and implement the same in a time bound manner.

The Committee may be apprised of the action taken within six months of the presentation of this report.

12. Inventorisation of water bodies and formulation of targets and compendium of rules : The Committee are startled to note absence of a database on inventory of water bodies and keystone species. Worse, no assessment of the risks of polluted water in rivers/lakes/ground water to health and environment has ever been conducted across the Country. On the slow pace of identification of keystone species, the Committee were apprised that identification of keystone species was location-specific and need-based. Admittedly, efforts towards a comprehensive inventorisation water bodies in the Country were being made by the CPCB in collaboration with the National Remote Sensing Centre (NRSC) to harness the potential of remote sensing for such a gigantic task besides launching of web-based India Ground Water Information System (GWIS) Project, a Joint venture with ISRO to make water resources data available in Standard GIS form to user community. In order to have a comprehensive inventory of all river/lakes/ground water sources of the

Country, the Road Map also points out the efforts of CPCB and SPCBs to intensively survey polluted river stretches and water quality monitoring carried out at 1700 locations in rivers/lakes/tanks, etc. and groundwater monitoring in 1500 locations by Central Ground Water Board (CGWB). Notably, there is almost total absence of biological indicators coupled with a very poor periodicity of testing of chemical indicators done only once a year revealing the dismal state of affairs. Insufficient infrastructural facilities in CPCB and SPCBs; inadequate natural water flows in rivers/streams due to discharge of sewage and industrial effluents and diversion of water for various purposes including irrigation; inadequate laboratories; inadequate trained manpower such as taxonomists who are needed for identification of species in the rivers; resource constraints for undertaking review of research activities already carried out, etc. and new studies for identification of bio indicators have been cited as hindrances towards the complete inventorisation of biological indicators. The Committee are also dismayed to find that though a wide range of human and natural processes affect biological, chemical and physical characteristics of water contaminating and impacting their quality adversely, identification and quantification of such contaminants had not been done in respect of any river or lake in India by MoEF, CPCB or by MoWR. Similarly, while identification and quantification of pollution levels in ground water in terms of arsenic, nitrate, iron, fluoride and salinity in groundwater for each of the States in India has been done by CPCB, the Committee note with profound concern that no identification and quantification has been done regarding presence of nutrients, human produced chemicals and other toxins in ground water. Needless to say, numerous human activities *viz*. agriculture with resultant nutrient enrichment, pesticide contamination and increasing salinity, industry, mining, disposal of human waste, growth, urbanization, climate change, etc. do impact water quality to a great extent and are major causes of water pollution. Intriguingly, the Committee find that at the centre while MoEF/CPCB/MoWR have not carried out assessment affecting the quality of water from any such activity based perspective, the scenario is worse in the States with only a few states having

made assessment for quantification of the effects of various activities affecting the quality of water in various rivers and lakes. Worse, there was total absence of identification of risks to wetlands associated with rivers/lakes as also to major aquatic species, birds, plants and animals due to pollution of rivers and lakes posing a major risk to the environment as a whole. The Committee also note with serious concern that while in the year 2009, Ministry of Health and Family Welfare reported 1.14 crore cases of acute diarrheal diseases, the risks to human health from water borne diseases as a result of water pollution had not been assessed by the MoEF/CPCB. Admittedly, though the CPCB had undertaken studies/inventories of pollution sources and their effects in various river basins, resource constraints form the major impediment in the Water Quality Monitoring Programme. The Road Map further seeks to address pollution due to agricultural runoff through propagation of judicious use of pesticides and insecticides in agricultural practice as enforcement of pollution control laws for activities leading to such diffused pollution was difficult. Statedly, the National Environment Policy also recommends taking explicit account of groundwater pollution in pricing policies of agricultural inputs especially pesticides, dissemination of agronomy practices, encouraging Integrated Pest Management (IPM) and use of biodegradable pesticides through various projects viz. National Project on Organic Farming (NPOF); National Project on Management of Soil Health and Fertility (NPMSH & F); Modernisation of Pest Management Approach in India, etc. Besides, targets are being worked out to regulate pollution causing activities to develop water quality criteria and standards by CPCB based on risks assessment on the basis of scientific research work. The Committee further find that though the assessment of risks associated with exceeding laid down criteria have been laid down, the Road Map has not clearly stipulated the actionable plans to be taken in case of deviation or non-compliance from these criteria. On the aspect of groundwater pollution, the Road Map stated that the CGWB under the MoWR is the responsible agency and the Central Ground Water Authority has already issued necessary directions to regularize indiscriminate boring and withdrawal of groundwater to preserve and

protect ground water. Besides, the Report of Ground Water Pollution 'Hotspots'; 'Approach Paper or Ground Water Quality Issues in Andaman and Nicobar and Lakshdweep Islands; and 'Mitigation and Remedy of Groundwater Arsenic Menace in India – A Vision Document' has been published. Taking note of the glaring deficiencies and inadequacies in the planning for control of pollution in rivers, lakes and ground water, the Committee recommend:

(i) A comprehensive inventorisation be done of all rivers and lakes and the keystone species associated with them as a condition precedent for planning the control of pollution in acquatic resources within a stipulated timeframe;

(ii) Consolidated data be prepared and periodically updated both on qualitative and quantitative basis on water resources covering surface as well as ground water in the Country so as to facilitate setting objectives for water pollution prevention and control;

(iii) Appropriate and effective mechanisms be established for resource support and funding requisite studies for identification of biological indicators capable of detecting low level toxic pollutants not measurable by chemical indicators;

(iv) Earnest efforts be made to achieve the targets set by the Planning Commission for restoration of polluted river stretches into their pristine form by the year 2017;

(v) Identification and quantification be done of contaminants to both surface and ground water as well as the risk assessment associated with them be carried out expeditiously and appropriate remedial measures taken to control and prevent pollution of water and environment; and

(vi) A comprehensive compendium of environmental rules and regulations be prepared on the lines of the General Financial Rules (GFR) and circulated

to all Ministries/Departments/Organisations of both the Union and State Governments for strict compliance.

(vii) Organic farming must be encouraged and attempts should be made to bring, to begin with, 20% of the agricultural land under organic farming. The other two projects on pest management and soil management should also be integrated in the project of organic farming and requisite funds allocated for the purpose.

13. Water quality goals and sensitization of farmers : The Committee are dismayed to observe that MoEF have failed to develop water quality goals and corresponding parameters for each river and lake. The Ministry have merely developed water quality criteria for five activities and general standards of wastewater discharge to a water body, land and sea under the Environment Protection Act, 1986 but was yet to establish enforceable water quality standards that protect human and ecosystem health. Worse, neither any standards for agricultural practices and run off pollutants levels for rivers/lakes/ groundwater were set nor any monitoring of such pollution done by MoEF/CPCB/CGWB. Intriguingly, the CGWB stated that it was outside its purview revealing the confusion at the ground vis-à-vis the role and responsibilities of various agencies and resultant passing of the buck. The Ministry of Agriculture and concerned Departments are, statedly, introducing best management practices so that water quality is not affected due to run off which inter-alia includes awareness programmes of farmers communities towards use of optimum water, fertilizers and pesticides, encourage Integrated Pest Management (IPM) and use of bio-fertilisers/biodegradable pesticides, implementation of Farmers Field School (FFS) under IPM in a bigger way; etc. Also wetlands identified under the Ramsar Convention which were not so far considered for establishing water quality network were being covered with strengthening of the monitoring network during the 12th Plan period. The Committee observe that pollution from agricultural sources is one of the biggest

non-point source of pollution. But, surprisingly, the allocation for strengthening and modernization of Pest Management was ₹18.13 crore in 2009-10 and ₹35.00 crore in 2012-13. The allocation of ₹42.71 crore in 2011-12 for the National Project on Management of Soil Health and Fertility saw a decline to ₹30.00 crore in the year 2012-13 while the allocation for the National Project on Inorganic Farming remained more or less stagnant at ₹21.41 crore in 2009-10 to ₹21.00 crore in 2012-13. Taking in view that the MoEF had neither developed Water Quality Goals for each river/lake nor established any enforceable water quality standards especially for agricultural run offs, which is one of the biggest non-point sources of pollution, the Committee recommend that:

(i) Enforceable water quality standards for rivers/lakes/groundwater be fixed with deterrent penalty provisions for violations thereof in consultation with Ministry of Agriculture and Ministry of Water Resources so that clear and specific standards are laid down for pollutants such as nitrogen/phosphorus/ pesticides/ fertilizers, etc;

(ii) Vigorous and sustained efforts be made for educating/sensitizing the farmers for sustainable use of bio fertilizers/manures and Integrated Pest Management to prevent and control deleterious agricultural runoffs due to use of chemical fertilizers/pesticides constituting a major pollutant of water bodies especially the groundwater;

(iii) Linkages be set up/strengthened amongst institutions especially Ministry of H&FW and CPCB/MoEF/CGWB/SPCBs so that real time data collected on water quality monitoring may be shared instantaneously for immediate concurrent action by concerned agencies especially those having high risks to human health such as outbreak of water borne diseases, etc; and

(iv) The project 'Neem' which had been closed mid way may be restarted so as to harness India's rich biodiversity and to give impetus to environment

friendly agricultural practices.

14. Maintenance of eco flows : The Committee also observe that surface water also gets polluted due to want of adequate eco-flows. It is distressing that even after the 13th Finance Commission suggested for establishment of water Regulators in every State, not a single water regulator has so far been constituted. The Committee note with profound concern that in the absence of any Central Water Regulator to check large scale water diversion from water bodies for a variety of uses, the Country is not equipped to check diversion of water from its rivers for domestic use or control flows into rivers taking bulk of the water beyond our international boundaries. Taking note of the stark hydrological anarchy and the constitutional competence of the Union to regulate and develop the inter-state rivers as may be expedient in public interest, the Committee recommend that :

(i) Extraction from water bodies be limited only upto certain permissible level so as to guarantee eco-flow or sustainable level in the water bodies;

(ii) A Central Water Regulator as well as Water Regulators at the State Level for checking and regulating water extraction/diversion be set up expeditiously to check and control pollution levels; or the extant bodies be suitably restructured and equipped with such power; and

(iii) Installation of Water meters be made mandatory and the principle of 'Beneficiaries Pay' be applied all over the Country to water users for water-extraction beyond a permissible unit, as well as to avoid wastage of water.

15. Use of efficient water consumption and conservation techniques : Mindful of the rising population, limited availability of water, and the imperative need for adopting improved techniques for water conservation and prevention, water use

efficiency, recycling and reuse of drainage water, the Committee recommend that:

(i) Farmers be incentivised to grow more water efficient crops and adopt less wasteful irrigation technique like drip irrigation, take steps for gradual removal of water subsidies and people be encouraged to use more water efficient technologies and reuse waste water;

(ii) Indian Council of Agricultural Research (ICAR) and agricultural universities should develop new varieties of crops to substitute water guzzling varieties;

(iii) The traditional and time-tested ways of water harvesting and storage be popularized, encouraged and incentivized;

(iv) Appropriate mechanism be worked out involving the National Remote Sensing Centre (NRSC) and the Ministry of Agriculture (MoA) for harnessing the potential of remote sensing technology for conserving water, preventing evaporation loss and loss due to seepage of water into the soil, etc. by mapping the canopy stress of crops/plants; and

(v) Strict stipulations be made in the building byelaws/orders, etc. for reuse of greywater in addition to the existing provision for water harvesting.

16. Restoration of the Ganga and other most polluted rivers : The Committee are deeply distressed to observe that the Ganga, considered the holiest of the rivers by millions of people and a national river, has become one of the five most polluted rivers in the world. It is all the more saddening that despite launching of the 'Ganga Action Plan' and more recently (2009) of the 'Mission Clean Ganga' by the National Ganga River Basin Authority (NGRBA), the pollution level in the Ganga has only aggravated. The Committee note that despite the far reaching recommendations of the PAC (2003-04), made in their

62nd Report of 13th Lok Sabha on 'Ganga Action Plan', for creation of Sewage Treatment Plants, Industrial Effluent Treatment Plants, Toilet Complexes, Electric Crematoria, Improvement of Bathing Ghats, river front developments, etc., much remains to be done to implement those recommendations. The Committee note that the National Ganga River Basin Authority (NGRBA) was set up in 2009 as an empowered planning, financing, monitoring and co-ordinating authority for Ganga River. The Authority uses river basin as the unit of planning to shift from town centric to river-basin approach in order to have a comprehensive response covering water quality and flow, sustainable access, environmental management, prevention and control of pollution in the form of a national mission. The Committee are however, dismayed to find that the basin level approach has so far been extended only to Ganga River Basin though there are 24 major river basins in India. The Committee further note with concern that only government level stakeholders were involved in consultations while setting up the NGRBA and no involvement of private Sector/Civil Society in investment decisions in the planning process was found. Worse, MoEF took limited action on integration of policies, decisions and costs across multi-sectoral interests relating to pollution *viz.* industry, agriculture, urban development, navigation, fisheries management, conservation, etc. Strategic decision making at the river basin scale which guided action at sub-basin or local levels were also found to be absent. The Road Map however places a thrust on 'Innovative River Front Development Project' which were statedly under serious consideration for raising alternate revenue tools apart from collections by way of 'Beneficiary Pay' concept or through the PPP models. The Committee observe that under the 'Mission Clean Ganga', the NGRBA has set the target that no untreated municipal sewage and industrial effluents flow into Ganga by the year 2020. Notably, the NGRBA Programme contemplates support for investments in waste water, industrial pollution, solid waste and river front management and addresses non-point source pollution and ecological flows in contrast to a town-centric and 'end-of-the-pipe' waste water treatment focus of the previous efforts. The programme has also engaged the consortium of seven premier IITs in

preparing dynamic, basin-level management plans. Admittedly, various initiatives under the Mission Clean Ganga taken up by the NGRBA to holistically address the issue of control of pollution of River Ganga which *inter-alia* included Project on 'Pollution Inventorisation, Assessment and Surveillance (PIAS) in Ganga River Basin' for inventorisation of Grossly Polluting Industries discharging into the main stream of the Ganga. A total of 764 such industries had statedly been identified as on March, 2013 with waste water discharged amounting to 3200 MLD. Besides, monitoring work of 46 STPs and 3 CETPs; Action Plan to use Cleaner Technologies or reduction in waste for industries viz., Paper & Pulp, Distillery, Sugar, Chemical, CETP and STPs; Action Plan to check unauthorized mixing of sand, limestone, etc; Institutional Strengthening of Environmental Regulation and Capacity Building at an estimated cost of ₹ 71.66 crore; Real Time Monitoring System for River Ganga at an estimated cost of ₹ 85.40 crore out of which ₹ 3.36 crore had been earmarked for community monitoring with public participation involving NGOs, local institutions and social activists; etc have also been initiated. The Committee find that since the inception of NGRBA in 2009, the total expenditure incurred under various NGRBA Programmes for abatement and control of water pollution of river Ganga stands at ₹ 1178.06 crores as of December, 2013. The Committee observe that in comparison to the Ministry's own estimation of a cost of ₹ 26,000 crores for the National Mission for Clean Ganga within an eight year perspective plan, the expenditure incurred so far appears to be minuscule considering the fact that almost four years have elapsed since the inception of NGRBA. Statedly, efforts are also being made to develop strong and dedicated operational-level institutions for planning, managing and implementing the programme with single-point accountability, to empower the ULBs, proposal for 'Ganga Knowledge Centre' to upgrade the knowledge base for the Ganga System so as to ensure that planning and investments were made on strong and adequate information; to promote Public Participation through strategic and broad-based communication, etc. Emphasis has also been given for consideration of PPP model for funding of sewerage schemes, institution of 'automatic real time

monitoring system in the main stream of river Ganga so that the data generated at 15 minutes interval is monitored on a regular basis, etc. Taking note of the systemic deficiencies and the steps being initiated by the Government to restore the Ganga to its pristine form, the Committee exhort the Government to:

(i) Ramp up their efforts for effective implementation of NGRBA programme in a time bound programme;

(ii) Ensure that the 'Mission Clean Ganga' gets fructified by the year 2020 so that the purity of the Ganga is restored to its pristine form;

(iii) Develop appropriate river front development schemes in a time bound manner for raising funds for sewage treatment/pollution control of major rivers including of the river Ganga;

(iv) Involve the Private Sector as well as the Civil Society in the planning and implementation of the programmes of the NGRBA;

(v) Take efficacious initiatives/measures for integration of policies, decisions and costs across multi-sectoral interests relating to water pollution control such as industry, agriculture, urban development, navigation, fisheries management, conservation, poverty reduction strategies;

(vi) Ensure that the State River Conservation Authorities hold their meetings at regular intervals and effective interventions are made by the States to implement the projects; and

(vii) Extend holistic planning, implementation and monitoring of pollution control programmes to the 24 other major river basins of the Country.

The Committee should like to be apprised of the action taken to implement these recommendations and all other measures taken to implement the Mission Clean Ganga and to control pollution in other major

river basins of the Country.

17. Lack of accountability structures : The Committee are surprised to find that neither the MoEF nor the States have introduced any accountability structure either to prevent pollution of ground water or address pollution from agricultural sources. Although CPCB has prepared a list of sources of pollution, MoEF has not created any specific programmes to prevent effluents entering the rivers. Worse, even the implementation of the NRCP and NLCP was flawed due to the lack of comprehensive survey to assess the amount of pollutants discharged into rivers and lakes. The Committee observe that such deficiencies in the finalization of projects without any scientific data on actual pollution load on water bodies have affected the performance of the programme in so far as abatement of pollution control is concerned. Weaknesses in control activities to ensure accountability of technical and financial aspects of projects as also unsatisfactory level of implementation of projects in the States reveals itself with many projects delayed beyond the scheduled completion dates and 28 projects costing ₹ 251.27 crore constructed but not commissioned. The Committee also find that inclusion of rivers under NRCP was not based on their pollution levels with the result more polluted rivers were not selected for pollution control; the State-wise selection of rivers in NRCP was as symmetrical with more river stretches approved for selection from States like MP and TN though Maharashtra, Gujarat and Andhra Pradesh had more polluted rivers. Admittedly, States implementing the projects faced problems in land acquisition, getting requisite permissions, technical problems, problems from contractors, resistance from locals over proposals for construction of STPs, disputes over sites, inability to arrest sewage flow, non-availability of land, etc contributing to non-completion of projects resulting in poor implementation in many States. The gross ineffectiveness of NLCP in conservation and restoration of lakes is evident from the fact that only two of the projects out of 22 test checked, had been completed and rest had met time overrun or were abandoned. The Committee consider it

rather untenable that the NRCD does not deal with cases of industrial pollution on the specious ground that the industrial pollution is dealt with by CPCB. The Committee therefore feel that it would be appropriate and more efficacious if industrial pollution is also brought within the remit of NRCD where they pollute the rivers.

18. Need to promote environment friendly practices for treatment of waste : The Committee are concerned to find that inspite of the fact that under the NRCP, comprehensive programmes for execution of various types of pollution control works have been undertaken, the said projects suffers cost and time overruns due to lack of inter-agency co-ordination, delays in acquisition of land for STPs and pumping stations, contractual problems, Court Cases, etc. The revised guidelines for preparation of DPRs address, as claimed, issues that may impede implementation which *inter-alia* include preparation of City Sanitation Plan (CSP), integrated sewer network in place of drain interception and diversion, compulsory dovetailing of projects under JNNURM/UIDSSMT State Plans; Design, Build and Operate (DBO) model for O&M (Operation & Maintenance); Mandatory Tripartite MoA amongst GoI, State Government and ULBs; Dedicated cell for implementation of projects in States; Project proposal appraisal by independent Institutions/Experts for enhancing quality and cost optimization; third party inspection for implementation of projects; Recycle and reuse of treated sewage; adoption of innovation and best technology option for sewage treatment; use of digital maps and Information-Communication-Technology (ICT) tools for project planning and design; coverage of schemes for management of municipal solid waste ; stakeholder consultation at the stage of formulation and implementation of project to ensure active involvement of various stakeholders and civil society to generate support and encourage ownership; etc. While noting the good practices sought to be promoted in the revised guidelines which include *inter-alia* Rain Water Harvesting; promotion of solar energy; improved sanitation scheme based on higher user charges; upgradaton of existing community sanitation and

sewage infrastructure; thrust on innovative river front development (RFD) Projects; introduction of 'River festival; 'River Runs' under the Public Participation, Information, Education and Communication (IEC) Activities; Design parameters of STP based on actual measurement and analysis; etc. the Committee are, however, dismayed to find that the evaluation report of performance of 84 out of 175 STPs built under NRCP conducted by CPCB revealed dismal performance with only 8 rated as good, 30 satisfactory and 46 poor or very poor with inadequate capacity and utilization and neglected sludge removal facilities most of which were found to be out of order. Surprisingly, as also admitted by the Ministry, the national capital was treating only 62 percent of sewage generated, Bengaluru, 10 percent and Hyderabad, 43 percent with the exception of Ahmedabad treating the entire sewage generated. The Committee note that the points raised by the impact evaluation report of the NRCP and NLCP projects in the Country conducted by independent third parties have, more or less, been addressed by the Ministry. The Committee however observe that the DPRs remain technology neutral. The Committee find that 62 lakes all over the Country were identified for conservation under the NLCP by the Ministry in November, 2003 and State Governments were asked to review this list and prioritise the lakes in their States for submission of proposals under NLCP. The Committee are however dismayed to find that only 12 States/UTs had prioritized their lakes for submission of proposals under NLCP. Worse, bio-conservation zones have not been notified around the lakes to prevent encroachment of lake shoreline. <u>The Committee therefore recommend :</u>

(i) <u>Preparation of real time data of pollution load source-wise on each water body before the finalization and actual implementation of projects;</u>

(ii) <u>Important issues like environmental clearances, land acquisition and technical issues be anticipated and sorted out well in time to obviate hurdles at execution stage and to avoid time and cost overruns;</u>

(iii) <u>The reasons for underutilization of installed STPs be addressed expeditiously through appropriate mechanisms keeping in view the Ahmedabad city which treats the 100 percent sewage generated by it;</u>

(iv) <u>The Ministry ramp up its efforts so as to ensure a robust periodic inspection for monitoring the implementation of Water Pollution Control Programmes in accordance with the guidelines ; and</u>

(v) <u>MoEF and the States should plan drainage for the Cities as a whole In conjunction with the Ministry of Urban Development (MoUD), instead of piecemeal approval of random STPs and I&Ds as the implementing agencies work under the control of MoUD.</u>

19. <u>Ground Water Pollution</u> : The Committee deplore that no scheme or programme has been formulated to prevent pollution of ground water including the pollution caused from agricultural sources. Notably, no authority has been set up to look exclusively into issue of Ground Water Pollution on the lines of NRCP & CPCB. The Committee also note with profound concern that the Union MoEF does not implement any programme for treatment and restoration of groundwater. Similarly, no State had introduced any specific programmes for the restoration and treatment of ground water with the exception of Tamil Nadu and Rajasthan. A Vision Document on 'Mitigation and Remedy of Groundwater Arsenic Menace in India' has been brought out in June 2010 by the National Institute of Hydrology, Roorkee under the aiges of CGWB, New Delhi. The documents contains a Road Map for achieving envisaged targets for control and abatement of groundwater pollution especially to make it arsenic free among others. The Committee note with profound concern the occurrence of arsenic in groundwater and the consequential health hazards to the people which had been described as the biggest natural groundwater calamity in the world. An estimated 100 million people in the Ganga-Meghna-Brahmaputra Plains (including Bangladesh) alone are at a risk from groundwater arsenic contamination above

WHO guidelines, and a good portion of 500 million people living in this belt face the danger of drinking arsenic contaminated water. Similarly, certain area of Punjab is known as cancer belt due to contaminated ground water. The Committee are, therefore, anguished that the Government have totally neglected the area of the ground water pollution constituting a serious threat to millions of people across the Country. Taking note of the serious threat posed by contamination of ground water, the Committee recommend that:

(i) Specific Accountability Structure be established at the Central as well as the State Levels on an urgent basis for handling issues relating to ground water;

(ii) Specific Programmes be worked out at the Union as well as the State Governments for restoration and treatment of polluted ground water which is receding at alarming speed in many parts of the country; ;

(iii) The Road Map contained in the Vision Document on 'Mitigation and Remedy of Groundwater Arsenic Menace in India' prepared by the National Institute of Hydrology (NIH) be implemented on an urgent footing;

(iv) Alternate sustainable programmes be launched for ensuring supply of arsenic-free water through conjunctive use of surface water and in situ ground water after thorough scientific studies;

(v) End-users and beneficiaries be adequately sensitized and involved for their effective participation to make them responsible partners in the challenge to face the menace of groundwater pollution particularly to the silent dangers of arsenic contamination;

(vi) Available information generated through empirical research studies on groundwater pollution need to be consolidated and disseminated to forewarn the people of the affected areas;

(vii) Appropriate steps be initiated for emulation and replication of the success of West Bengal State in monitoring public sources of arsenic groundwater contamination;

(viii) In view of the magnitude of the task involved, suitable measures be taken for augmentation of capacity of laboratories, trained and skilled manpower, ready availability of robust, reliable, cheap and simple test kits to test ground water quality for arsenic contamination especially in vulnerable areas; and

(ix) A Strategic National Plan of Action be drawn up for providing arsenic safe water to the community on a priority basis after establishing a national standard for arsenic in drinking water.

20. Rigorous monitoring by, and regular connect between, Monitoring authorities : The Committee observe with profound concern that even though a high powered Monitoring Authority headed by the Prime Minister, Member, Planning Commission Union Minister, MoEF and Secretary, MoEF exists at the Centre and similar high powered Monitoring Committees headed by respective State Chief Minister, Chief Secretary, etc. exist at the States, the only review meetings were held by them way back in 2002 and 2003. This is reflective of sheer lack of monitoring at all the three levels viz., Local, State and Central. Worse, the four High Powered Committees existing at the Central level do not exist in a hierarchy and operate independent of each other with no evidence of sharing of their findings and recommendations. The Committee also note with concern poor internal controls and want of accountability as evident by poor monitoring of network to track pollution of water in rivers and lakes, failure to update and revise water quality parameters, absence of database, poor dissemination of data; etc; The Committee further observe paucity of network for tracking pollution of rivers, lakes and ground water; lack of classification of monitoring locations as baseline, trend and flux stations; lack of real-time monitoring of water pollution; lack of assessment of trophic status of rivers and assessment of ecological/biological

indices of rivers/lakes; irregular inspections of projects by MoEF and non-availability of completion reports of projects; etc. Statedly, the monitoring network comprises of 2000 locations in 27 States and 6 Union Territories spread over the Country covering 383 rivers (1085 locations), 127 lakes, 9 tanks, 59 ponds, 40 creeks/seawater, 17 canals, 34 drains and 595 well. The Committee were apprised that CPCB had initiated the process for installation and communication of Ten Real Time water quality monitoring stations (8 in Ganga and 2 in Yamuna) which were remotely controlled stations and likely to start functioning from the financial year 2013-14; development of web-based GIS (Geographical Information System) to disseminate water pollution monitoring data likely to be operational by end of 2013 as a step for improving both quantity and quality of such database; strengthening of monitoring network by converting all monitoring locations with stations and reclassifying as baseline with BoD level of less than 3 mg/l; trend stations with BOD of 3-6 mg/l; and impact Station with BoD level exceeding 6mg/l; etc. Considering that effective monitoring is *sine-qua-non* to effective implementation both for micro monitoring at the ground level and macro monitoring at the apex level, the Committee recommend that :

(i) Periodic review of the progress of implementation of water pollution control programmes be made mandatory at all the Central, State and Local levels;

(ii) Appropriate mechanism be evolved to bring about a more robust and effective functional connect amongst all the high powered Monitoring Committees at various levels so that their findings and recommendations are shared not only for effective synergy but also to obviate scope for duplication;

(iii) As envisaged in the Road Map, the role and responsibility of the public as a watchdog in monitoring of implementation of water pollution abatement/control programmes as one of the most potential tool for effective monitoring need to be publicised aggressively and on a sustained basis all over the Country; and

(iv) As envisaged, steps to generate accurate real-time monitoring data, based on absolute values of parameters like Total Coliform (TC)/Faecal Coliform

(FC)/ Dissolved Oxygen (DO), etc. instead of average values as also other initiatives to strengthen the monitoring mechanism be implemented to achieve tangible outcomes within the given timeline.

21. Assessment of ongoing pollution control programmes : The Committee are disturbed to observe that despite more than 26 years of implementation of programmes to control pollution of rivers, our rivers remain critically polluted with high levels of organic pollution by the presence of high levels of BOD, DO and TC and the inability of our rivers to sustain acquatic life due to organic pollutants and high levels of faecal-related bacteria, viruses and protozoa which causes diseases, only reveals the failure of the efforts of the Government to control pollution in our rivers through NRCP. The Committee also note with profound concern that the results of the programmes under NLCP, in operation for more than 10 years, had not been assessed to ascertain measurable improvement in chemical parameters of lakes. Worse, no impact assessment was possible for control of pollution of ground water as no programme, either at the Central Level or at the State Level, was being implemented for control of pollution and restoration of groundwater despite increasing pollution of ground water sources and presence of contaminants like arsenic, nitrate, fluoride, salinity, etc. The Committee observe that though water is a state subject and pollution prevention and conservation of water bodies including lakes remain in the domain of State Governments, the NRCD being the primary funding agency and the nodal authority for prevention of pollution, greater responsibility rests with the MoEF. The Committee, therefore, urge that inadequacies and deficiencies observed in the Audit report may be addressed expeditiously and a nationwide impact assessment be done of all ongoing programmes for control and abatement of pollution of water to ascertain their efficacy and to take mid-term course corrections, if required. Urgent and efficacious measures may also be taken as contemplated in the Road Map and also outlined in this report, for controlling pollution of ground water, lakes and rivers. The Committee may be apprised of action taken in this regard in due course.

22. <u>Higher allocation, and effective utilization, of funds</u> : The Committee note with profound concern that funds available for control and prevention of water pollution and restoration of wholesomeness of water were ₹ 3.28 crore per State/UT per year during the last 5 years. This is just a pittance given the gigantic problem of pollution prevention. Worse, the implementation also suffered due to poor financial management like diversion of funds, non-disclosure of accrued interest, funds not utilized for implementation, funds parked in bank accounts, unspent balances not refunded, cost overruns and escalations due to tardy implementation, etc. The Committee are dismayed to note that resources generated from water cess constitute a very meagre amount which was barely 10.75 per cent of the total expenditure incurred by MoEF with disbursement to CPCB and SPCBs amounting to ₹ 820.65 crore in the last five years (2005-2010). Notably, the water cess collected under the Water (Prevention and Control of Pollution) Cess Act, 1977, for being disbursed to CPCB and SPCBs remained dismally meagre due to extremely low rate structure of Water Cess which is two paisa to fifteen paise per kiloliter with defaulters liable to pay three paise to thirty paise per kiloliter. Surprisingly, the Committee observe that in the last 34 years, the Water Cess rate was revised only in 1992 and 2003. <u>Keeping in view that funds allocated for implementation of programmes relating to prevention of pollution rivers, lakes and ground water need to be spent effectively, efficiently and economically, the Committee recommend that:</u>

(i) <u>Allocations for control of water pollution be commensurately enhanced given the gargantuan problem of water pollution and the looming threat to human beings and the entire ecology;</u>

(ii) <u>The monitoring mechanism be thoroughly overhauled and adequately strengthened so that allocations are fully utilized, projects are strictly monitored and there is no time and cost overrun;</u>

(iii) <u>The initiatives enumerated in the Road Map for effective utilization of Funds</u>

and improved/speedy implementation of projects be implemented in right earnest ; and

(iv) Appropriate and periodic revision be made in the water cess rates and the base of cess payers expanded.

23. Building public awareness and partnership : The Committee are startled to observe that the programmes for abatement of water pollution was mostly contractor driven with discussions being limited generally to State Governments and Local Bodies with no meaningful involvement of the people and the community. Considering the enormity of the problem of water pollution and its threatening implications for the nation, the Committee hardly need to emphasise the overriding need for heightening public awareness, meaningful involvement of the civil society in project formulation/implementation/ monitoring and making them responsible partners in the national campaign to control water pollution. Notably, building on the lessons from the Ganga Action Plan, the NGRBA Framework Communication and Public Outreach Programme envisages involving every stakeholder including Students and Youth to ensure effective abatement of pollution and conservation of river Ganga through strategic communication and enhanced public participation and outreach. The PAC (2003-04) in their Ganga Action Plan Report (62nd, 13th LS) had made specific recommendation for building awareness for keeping the Ganga Clean. The Committee in their ATR [26th Report of PAC (2005-06)], had deplored that the Government treated a vexed question of raising mass awareness campaign against throwing non-cremated dead bodies in the holy river as a simple law and order problem which was to be handled by the Superindentent of Police. Subsequently, in their Action Taken Statement on the Report, the Government stated that local seers and public representatives were being persuaded in the State of Uttaranchal to create a consensus on stopping Jal Samadhies and burning of dead bodies but the goal was yet to be fully realized. It was assured that, improved wood based crematorium were being promoted due to erratic power supply and also general public reluctance to

accept the electric crematorium, acceptability of which was also found to be very low. The Committee also find that no monitoring mechanism exists on the actual number of dead bodies thrown in the river over the years. The Committee also observe that the DRSC on Science and Technology, Environment and Forests in their 112th Report on Demand for Grants (2003-2004) of the MoEF referred to the successful cleansing of the Thames River. Notably, the demonstrated rebounding of river Thames with its full biodiversity which was declared biologically dead in the 1950s, is a tangible proof which needs replication in India. Admittedly, the National Mission Clean Ganga (NMCG) has taken this as an important reference and it was part of NMCG's Communication and Public Outreach Campaign during Kumbh Mela. The Committee further find that the Road Map of the MoEF also envisages necessary formulation of effective public education, awareness and participation programme as part of DPR so as to make the projects sociably acceptable. The Committee further find that hiring of expert agency to formulate Public Participation Strategy, arrangements to involve volunteers of NYKs, Public as Watchdog in monitoring/supervising project implementation and O&Ms are also envisaged to be integrated with this component. Keeping in view their aforesaid observations, the Committee recommend that:

(i) Engineering centric approach may be adopted for more efficient Sewage Treatment Plants which may be integrated with a social centric approach so that sewage treatment and pollution control emerges as an impactful national movement;

(ii) The demonstrated successful model of cleaning river Thames may be replicated through appropriate adaption of techniques and strategies for cleaning our rivers, beginning with more polluted rivers;

(iii) The Vedic invocation to the rivers and the Mother Earth and the scriptural edicts prohibiting pollution of rivers as contained in the Rig Veda, the Atharva Veda, Brahmanda Purana and other texts be compiled and popularized and also included in school syllabus to heighten public

awareness with respect to the dire need for restoring the purity of our rivers;

(iv) A comprehensive and effective public participation and outreach programme may be formulated, as also envisaged in the Road Map and put in place expeditiously; and

(v) The youth power should be harnessed for creating awareness and suitable programmes under National Service Scheme (NSS) launched.

24. Conclusion : The Committee's examination revealed *inter-alia,* fundamental weaknesses in the Constitutional, Legislative, Policy and Institutional frameworks governing the issue of prevention and control of Water Pollution in India; gross deficiencies in the planning for control of pollution of rivers, lakes and groundwater with incomplete inventorisation of rivers/lakes and keystone species associated with them and non-identification of existing pollution levels, non-quantification of contaminants, etc; unsatisfactory performance and shortfalls in the implementation of programmes such as National River Conservation Programme (NRCP) and National Lake Conservation Programme (NLCP) for control of pollution of rivers, lakes and ground water as well as inadequate monitoring of these programmes pointing to weak internal controls existing at all levels of Government; ineffective monitoring of implementation of projects at the level of the States, delays, cost escalations and poor quality work; inadequate funds for control and prevention of water pollution and restoration of polluted water aggravated by poor financial management calling for far greater oversight over utilization of funds to ensure that funds are spent timely and for the purpose sanctioned; total neglect of the aspect of addressing ground water pollution particularly arsenic contamination; woefully inadequate and undeterring penalty provisions; a highly tolerant inspection regime of the SPCBs; and engineering centric approach towards tackling the issue of water pollution with more emphasis on Sewage Treatment Plants; etc. The Committee find that a Road Map

for Management of Water Pollution in India as well as a Vision Document for Mitigation and Remedy of Groundwater Arsenic Menace in India have been brought to mitigate the problem of Water Pollution in all forms and manner. Reiterating that the Government implement the measures outlined in their own Road Map, the Vision Document and the recommendations made in this report with a sense of national urgency in an integrated and holistic manner so as to conserve, preserve and ensure the purity of all our water bodies, the Committee recommend that they be apprised of the implementation status within six months of the presentation of this report.

New Delhi
December, 2014
Agrahayana 1936 (Saka)

PROF. K.V. THOMAS
Chairperson,
Public Accounts Committee.

ANNEXURE - I

IMPLEMENTATION ASPECTS OF PROJECTS UNDER THE NATIONAL LAKE CONSERVATION PLAN (NLCP) AS ENUMERATED IN THE ROAD MAP FOR 'MANAGEMENT OF WATER POLLUTION IN INDIA' BROUGHT OUT BY MoEF IN MARCH, 2012.

PREPARATION OF PROJECTS UNDER NLCP

(i) The components/activities covered under NLCP are aimed at achieving treatment/rejuvenation of polluted/degraded lakes.

(ii) Under the scheme, prevention of pollution load entering the lake from its basin/catchment is ensured by intercepting, diverting and its treatment. These works include sewerage and sewage treatment for the entire lake catchment. Moreover, I & D works are planned either separately for the isolated lake catchments as a part of basin management or dovetailed with the integrated sewerage system for the whole town under other schemes of JNNURM/UIDSSMT of Ministry of Urban Development.

(iii) The mandate of NLCP Scheme is pollution prevention and conservation of perennial lakes. To ensure that, hydrological balance for lake catchments is considered, which is dependent upon physical profile of the water body, climatic conditions including precipitation, land use pattern of the area etc. Afforestaion as a part of catchment area treatment has a positive impact on surface runoff availability to the lake.

(iv) Water is the State subject. Pollution prevention and conservation of water bodies including lakes remains the domain of the State Governments. National River Conservation Directorate (NRCD) in the Ministry is supplementing efforts of the State Governments in conservation of lakes through centrally sponsored scheme of NLCP for conservation and management of polluted and degraded lakes in urban and semi-urban areas of the country.

(v) In absence of specific water quality criteria in respect of lakes, for the present, the target is to achieve lake water quality as notified in respect of rivers under NRCP i.e. Designated Best Use (DBU) criteria for surface waters for bathing quality, which in turn signifies health of lake ecosystem.

(vi) Water quality of lakes, indicating their health, is being assessed by the concerned State Governments/IAs in regular manner to evaluate the impact of conservation measures undertaken, both during implementation and post project phase. Improvement in lake water quality and addressing lake catchment aspects responsible for lake degradation, leads to improvement in lake ecology over a period of time.

(vii) Under the GEMS/MINARS Programme, water quality monitoring of surface water bodies including lakes across the country is being carried out regularly by CPCB/SPCBs. Presently, water quality of 107 lakes at 117 stations is being monitored by CPCB.

(viii) The focus of lake conservation programme is on improvement in water quality in physio- chemical terms. Water quality monitoring of lakes, both during implementation and after completion of the project, is being carried out by the concerned State Governments/IAs in regular manner to evaluate the impact of conservation measures undertaken. Status on water quality of lakes also forms a part of the proposals (DPR) submitted for consideration under NLCP.

(ix) The water quality of lakes as reported in the DPR serves the purpose of assessment of their pollution status. The water quality for most of the lakes has shown improvement over their pre-project quality.

(x) Due to prevailing site conditions, local/physical constraints and other implementation problems, it may not be practical and feasible many of the times

to execute the works by the concerned State Government/IAs, within the schedule time frame. That remains a key factor for not submitting the physical progress report and UC/ESs by the concerned IAs in regular manner.

(xi) In the States, namely, Karnataka, Madhya Pradesh, Uttarakhand, and J&K (major beneficiaries of the programme), Lake Development/Conservation Authorities are already in place at the State level, for co-ordination with all the concerned departments/agencies and to monitor the implementation of works in the respective States. In Rajasthan, the High Level Standing Committee (with the MoEF representative as its member) has been set up under the Chairmanship of the Chief Secretary, for policy formulation & regulation of River/Lake Development Programmes.

(xii) NLCP is a scheme with multi-sectoral approach leading to problems of recruiting single Design & Structure Consultants. Also, the bidding process at State level & other modification process take a longer time in some cases leading to delays in implementation. Besides these, other site specific problems for some of the projects have also resulted in delayed start or their implementation.

(xiii) Evaluation of NLCP together with NRCP, is presently being carried out by independent agencies engaged by this Ministry.

xix) Lakes are presently not covered by any specific legal statute, but several legislations enacted till date have relevance and provisions for conservation of lakes. These include the Forest Conservation Act, 1980, the Wildlife Act, 1972, The Water (Prevention & Control of Pollution) Act, 1974 and the Environment (Protection) Act, 1986. National Environment Policy (NEP), 2006 also speaks for setting up of a legally enforceable mechanism for lakes and wetlands to prevent degradation and enhance their conservation.

The objective of NLCP scheme is to restore and conserve urban and semi urban lakes of the country through an integrated eco-system approach, which takes care of conservation measures for the entire lake catchment. NLCP guidelines are also framed to prepare proposals based on catchment approach.

Core components under NLCP include prevention of pollution from point sources by intercepting, diverting and treating the pollution load entering the lakes from their catchment. Accumulation of nutrients is also addressed by in-situ lake conservation measures, catchment area treatment works, hydraulic improvement of feeders etc.

As such, the guidelines for NLCP help in preparation of comprehensive DPRs taking into consideration the entire lake catchment including pollution especially through sewage and surface run-off.

LAKE ENCROACHMENT

Conservation of water bodies and the Issues related to their encroachment fall within the domain of the respective State Governments. However, administrative requirements contained in NLCP guidelines call upon the project proponents for the following:-

i. To take necessary steps for declaring the lake boundary through a Government order,
ii. To ensure removal of encroachments in the lake submergence area/lake boundary,
iii. To consider for notifying the ‘Establishment of a Bio-conservation Zone’ around the water body for better safe guard of lake surroundings from the growing pollution potential and the encroachments

RESTRUCTURING THE NLCP PROGRAMME

Out of 61 Lakes covered under the NLCP scheme, works on 23 lakes have since been completed so far. The project on twin lakes in Mokokchung (Nagaland) were sanctioned in Oct, 2009 and are targeted for completion in Oct, 2011, hence not delayed. The Pushkar Sarovar project was sanctioned in October, 2010 with implementation period of 30 months.

Though some projects like Banjara lake in Huderabad, Veli-Akkulum lake in Kerala, Kodaikanal lake in Tamilnadu etc. have been delayed due to interventions of local stakeholders or for other inevitable reasons, the Ministry has been interacting with the respective State Governments at different levels to resolve the stalemate.

As contained in NLCP guidelines, presently, the target as per NLCP guidelines, is to achieve lake water quality as per Designated Best Use (DBU) criteria for surface waters for bathing quality(as notified in respect of rivers under NRCP), which in turn signifies health of lake ecosystem.

The focus of lake conservation programme is on improvement in water quality in physio-chemical terms. Water quality monitoring of lakes, both during implementation and after completion of the project, is being carried out by the concerned State Governments/IAs in regular manner to evaluate the impact of conservation measures undertaken. Status on water quality of lakes also forms a part of the proposals (DPR) submitted for consideration under NLCP.

Funds for setting up labs to analyse the water quality through approved labs have been sanctioned for all projects under NLCP. The water quality for most of the lakes has shown improvement over their pre-project quality.

SELECTION OF LAKES FOR INCLUSION UNDER NLCP

In order to identify polluted and degraded lakes across the country and at the instance of Planning Commission, a study was carried out by the Ministry in November 2003. A list of 62 lakes across the country requiring conservation was prepared under the study. The State Governments were asked to review this list and to prioritize the lakes in their States for submission of proposals under NLCP.

Some states namely Chhattisgarh, Himachal Pradesh, Bihar, Manipur, Assam etc, furnished priority lists but either did not submit any proposal for consideration under NLCP, or the same were not found meeting NLCP guidelines. Other States sent their proposals, which were examined in the Ministry and approved for funding under NLCP, following the Guidelines of Ministry of Finance in this regard.

Some proposals for conservation of lakes were received and sanctioned even before the States were requested for prioritization. The States at times, also resorted to changing the order of prioritization.

New proposals for conservation of lakes are considered for sanction subject to their admissibility as per NLCP guidelines, pollution status, prioritization and availability of funds under the Plan.

The Ministry has subsequently revised and published NLCP Guidelines in May, 2008, in consultation with the experts, State Governments/LDAs/concerned IAs and other stakeholders. The States have since been proactive and more concerned about the lake conservation in their jurisdiction

PRESCRIBED DIRECTIONS REGARDING POLLUTION PREVENTION AND TREATMENT

Ministry of Environment and Forests has been implementing the National Lake Conservation Plan (NLCP) since 2001 for conservation and management of polluted

and degraded lakes in urban and semi-urban areas. The major objectives of NLCP include encouraging and assisting State Governments for sustainable management and conservation of lakes. Under NLCP, MoEF had issued guidelines for preparation of detailed project reports and focuses upon the responsibilities of the State Governments to work in close partnership with the Government of India in protection, conservation and sustainable management of lakes.

In order to identify polluted and degraded lakes across the country, a study was carried out at the instance of Planning Commission. A list of 62 lakes across the country requiring conservation was prepared under the study. The State Governments were asked to review this list and to prioritize the lakes in their States for submission of proposals under NLCP. Proposals for lakes conservation are considered for sanction subject to their admissibility as per NLCP guidelines, pollution status, prioritization and availability of funds under the Plan.

In so far as prevention is considered, pollution of lakes is due to discharge of untreated waste water and commercial effluents. It is the responsibility of SPCBs and ULBs to enforce discharge standards which have been notified by CPCB/SPCBs

In the light of experience gained in the implementation of GAP and NRCP, it is now recognised that effective civil society / public participation can only bring about full success of the programme. As per the revised guidelines, it is necessary to formulate an effective public education, awareness and participation programme as part of DPR so as to make the projects socially acceptable. An expert agency with right kind of background and experience may be engaged to formulate Public Participation strategy.

Two types of outcomes are expected from this activity. The first one is public participation and through it agreement on complex issues like house connections, water conservation at household levels, proper collection of garbage so that it does not choke sewers/drains, sharing increased burden of O&M cost, proper layout of sewerage systems and location of STPs, diffusing conflicts, if any, on programme components etc. This can be best achieved through consultation at various stages of project formulation

and implementation. The second one is increasing public understanding about the programmes through awareness. This should be achieved through workshops, seminars, street plays, city runs and riverside walks. Active involvement of students and teachers community in schools and colleges can greatly help in achieving the objectives. Public can also play the role of a watchdog in supervising project implementation and operation and maintenance which would help improve the quality of the programme. Emphasis may be placed on increasing public participation under NGRBA. Apart from hiring expert agencies for this purpose, arrangements to involve Nehru Yuva Kendra Sangathan have been put in place, which should be integrated with this component.

INTEGRATED MANAGEMENT OF ALL IMPORTANT RIVERS, LAKES AND GROUND WATER AS IT IS DONE FOR RIVER GANGA

The present coverage of Rivers and Lakes under the NRCP and NLCP respectively is based on the resources allocated to the Ministry by the Planning Commission. The river conservation strategy is being reviewed from time to time in the light of experiences gained. Taking on board the lessons learnt, the National Ganga River Basin Authority has been constituted as an empowered planning, financing, monitoring and coordinating authority for conservation of the Ganga River with a holistic river basin approach with new institutional structures at the centre and state levels. The objective is to have the river basin as the unit of planning, a shift from the earlier town centric approach and to have a comprehensive response covering water quality and flow, sustainable access, environment management, prevention and control of pollution and food and energy security, in the form of a national mission. A holistic approach in preparing pollution abatement projects is now being adopted. The revised approach will serve later as a model for other rivers also. Presently, the central plans for lakes and wetlands are proposed to be merged from the 12th Five Year Plan onwards to enable an integrated approach. Further, it is submitted that the issues related to management of Ground Water are dealt by the Ministry of Water Resources.

ANNEXURE II

GIST OF IMPORTANT SUGGESTIONS/VIEWS RECEIVED FROM THE PUBLIC IN RESPONSE TO PAC COMMUNIQUE DATED 30.08.2012 PUBLISHED IN 30 LEADING DAILIES ALL OVER THE COUNTRY (ENGLISH/HINDI/REGIONAL LANGUAGES) ON 'PREVENTION OF WATER POLLUTION'

Considering the larger importance and topicality of the subject, the Committee had elicited the response of interested organisations/public through a Press communiqué published (Hindi/English/Vernacular languages) all over the country. A total number of 118 Memoranda, 64 in English and 54 in Hindi were received from across the country. This includes various suggestions from individuals/organisationS like fresh environment consultancy; Tata Consultancy Services; North East Institute of Science and Technology; The Energy and Resources Institute (TERI); etc. A gist of the more important points and issues culled out from these suggestions is reproduced below.

I. RESEARCH ON POLLUTION OF WATER

- Help of Regional Research Laboratories (RRL) should be sought to find out the exact nature of pollution whether from chemical discharge or massive microbial load into the water as is done by Regional Institute of Science & Technology, Jorhat, Assam.
- Solution to the problem of chemical water pollution is chemical purification and for bacterial pollution, it should be ultra violet filtration
- Panchayat level water purification system for providing drinking water at village level with budgetary provisions.
- Proper utilization of surplus water in states like Assam by way of establishing water bottling plants.
- Proper methodical calculation about water requirement for each state based on population (as per population census data) agriculture and industry needs.
- Study on pollution level and pollution pattern as per the requirement, rainfall topography of all States.

II. THE FUNCTION OF THE MUNICIPALITY /CORPORATIONS/LOCAL BODIES TO INCLUDE:

- Identifying the domestic sewage and industrial effluents according to their quality and quantity.

- Proper channeling or piping of effluents either domestic sewage or industrial effluent to the storage pits/chambers upto the treatment plant.
- Operation and maintenance of the treatment plant

III. FUNCTION OF STATE GOVERNMENT AND CENTRAL GOVERNMENT TO :

- Provide fund for erection of treatment plant to the municipalities or local bodies for their work towards designing, execution of the treatment plant and Distribution of the treated water and

IV. FUNCTION OF THE STATE AND CENTRAL POLLUTION CONTROL BOARD

- Monitor violation of laws by the governing bodies & individuals and checking the treated water parameters as dissolved oxygen, BOD, COD, boron, ph, oil and grease other element like cromium, hg etc.
- A write up on Sewerage treatment process has also been enclosed.
- Pro - action on environmental protection and all kinds of pollution.
- Pro - action of drainage system of factories and cities.
- Drainage system should be effective
- Drains from companies/factories should be regulated/monitored, samples to be taken and analysed.
- Any factory drain/dispose with highly polluted water should be collected within the factory area and disposed off through proper chemical process
- Garbage management policies such as different colour coding for garbage segregation and disposing, etc. should be put in.
- There are rules under various provision but the provisions of law must equally give punishment to Officials/staffs who do not detect water pollution in his area of supervision. A day in a week must be made mandatory for all officials from top to bottom to be on inspection and all inspection records be made transparently online for public.

A) Industrial Disposals: Almost all the Major Industries situated along river beds, which are periodically audited by Central Pollution Board, do have ETPs. But it has to be strictly ensured that all the ETPs are working throughout the year and most importantly no untreated water shall pass straight into the river. A particular Dept should be accountable for any non conformity.

B) City Disposals: Sanitation organizations shall plan strict strategies to clear water before disposing it to river. Heavy penalties for Small / Medium industries for disposing untreated water into common sever lines and create general Civic awareness.

C) Miscellaneous: Pollution from excessive usage of chemical fertilizers to be checked by using alternatives.

D) Indirect: to arrest the depletion of rivers own mechanism to cleanse itself. River beds to be cleaned periodically and incorporation of natural cleansers into the river. Joining rivers of flood affected areas through channels will be dually beneficial. Water harvesting should be promoted on priority basis so that underground water quality/table rises.

Implementation can be done only through honest efforts and developing civic senses, which we lack.

V. INDUSTRIAL EFFLUENTS

No industries should be allowed to deposit industrial waste both wet and dry into rivers, tanks and wells. The working of statutory boards monitoring and measuring pollution must be reviewed and steps must be taken to improve it. The problems of these boards must be sorted out at the earliest. In no case the canals bearing industrial waste should be flowing towards rivers. **If there are any plan of joining rivers, they must be implemented fast.**

• Recycling all types of waste

• Propagation and promotion of Waterfilters

• Water treatment plants through public private partnership mode.

The capacity of the existing plants must be expanded further and new technology in this area may be adopted.

Study may be conducted as to :

- Whether upgradation of unauthorised layouts reduces the risk of water pollution. Recently Delhi govt has taken this commendable step.
- Whether temples all over the country are contributing to water pollution.

Practical ways you can prevent water pollution

- Store and handle hazardous substances carefully
- Prevent pollution from uncontrolled releases or leak by marking loading and unloading areas and isolating them from the surface water drainage system;
- Store all above-ground storage tanks, drums and containers on an impermeable base within a drip tray, bund or any other suitable secondary containment system to contain any spills;

- Install drip trays, or other forms of containment, beneath any equipment that is likely to leak or result in spills of pollutants.
- Empty drip trays regularly so that they do not overflow.
- Procedures to prevent pollution from drainage system, eg. keep an updated drainage plan and colour code your drains.

Water harvesting in all cities and towns and villages.

- **Ban the manufacture of thin plastic bags.**

- **Unshackle the rivers from various projects**

- **Sewage disposal of cities into the river** should adhere to mandatory and set benchmarks which the local municipal corporations and independent agencies should monitor the quality of the discharged water. Repeated violation of benchmarks should be the reason to punish the officials responsible for it.

- **Jail term and attachment of property for polluters.**

  Punish the perpetrators and punish the officials who failed to report and check this violation.

- **Invite experts from all over the world who have been able to successfully revive and restore the rivers in their own countries.**

  It has to be a holistic plan and implemented with integrity.

- **Run campaigns for the students**

- **Use environment-friendly household products**

- **Apply natural pesticides and fertilizers**

- **Don’t litter**

- **Disposal of litter in an appropriate waste disposal area.**

- **Dispose of toxic products with care.**

- **Use less water as** decreasing water consumption is one of the keys to minimize water pollution.

VI. FOCUS ON THE INDIVIDUAL AND THE COMMUNITY CAN HELP TO MINIMIZE WATER POLLUTION.

- **Case study of Bombay Municipal Corporation for efficient reduction of plastic waste responsible for water pollution- use of powder named POLYBLEND as road making material there by reducing plastic waste while also increasing efficiency of roads by 30 per cent. This step can be taken forward on a large extent for reduction of plastic waste.**

- **In water treatment plants, more B.O.D plants must be introduced providing oxygen for the aerobic microbes to breakdown more and more organic waste and make the water pure for further use.**

- **Community participation – Community can take up strict steps themselves to save our water resources. In villages, people should be taught and educated about the adverse affects of water pollution and should be encouraged to save water as much as they can because it's only them who can make a change.**

- **Water harvesting must be made compulsory for every society to take up. Deadline should be set up under which every household should come up with this practice. This step has been taken in certain places such as some parts of Mumbai, Kerala etc. and positive results have shown its success.**

  Strict laws must be set up and heavy fines must be imposed for throwing garbage in water bodies and workers should be enforced taking care of these resources. This step can even combat the problem of unemployment.
- **Replacement of sewer pipes in Trilokpuri Colony, East Delhi, which are 30 years old resulting in contamination of drinking water supply through it.**

- **Collection and testing of polluted water, identifying its make-up and chemical composition and source as to where it comes and treating it suitably to make it fit for re-use for marine life and people.**

- **Municipal sewage: Shift from Combined System to Separate System.**

- **Removal of organic wastes through mechanical, biological or chemical treatment processes.**

- **Removal of nitrogen and phosphates.**

- **Removal of salts through the process of 'Elecrodialysis'.**

- **Insecticides, Pesticides, Chlorinated hydrocarbons and Weedicides: Carbon absorption tertiary water treatment is effective method in removing organic pesticides.**

- **Urgent need of public-private partnership in treating polluted waters for community participation in small towns and villages, the following can be done:**

- **Awareness among masses using different media. Funds may be earmarked for this purpose.**
- **Awareness of school-going students special lecture and introducing text books and designing special courses on the topic in villages.**
- **Awareness of farmers on judicious use of input like fertilizers and pesticides etc. in agriculture. A 4Rs programme on i) Right types of chemical, ii) Right dose, iii) Right method of application and iv) Right time of application be initiated urgently. For this, all resources including State Agr. Universities facilities like KVKs be geared up.**
- **Awareness of villagers, especially ladies to rightly handle garbage.**
- **Community participation programs can be started for reclamation of polluted water.**

- **All efforts being made in big cities through Municipal Corporations in handling sewage may be initiated in small towns and villages as well.**

VII. EFFECTS OF SEWAGE TREATMENT :

- **All forms of sewage treatment consist of a sequence of physical, biological and sometimes chemical processes aimed at removing dissolved and suspended organic matter. The sewerage system needs to be repaired at fixed intervals on scientific considerations. The water standing on the road ad adjacent areas are to be drained out immediately.**
- **Tanks, ponds, natural reservoirs overgrown with weeds and containing insects are to be cleaned at a regular interval as per expert/scientific decision.**
- **Dead bodies of human, animal, beasts; corpses, half burnt corpses not to be thrown to river and natural water reservoirs. Dead bodies of animals not to be thrown on roads/streets, arks, any public laces or private land. Punishment to be fixed for that.**
- **Water and other environmental pollutants causing surface and ground water pollution are not to be discharged by Industries outside their premises.**
- **Industrial, domestic effluents are not to be discharged into water courses without adequate treatment.**

VIII. TREATMENT OF POLLUTED WATER

- **Biological Filter**

- **Sludge digestion and drying**
- **Teritary treatment**
- **Agricultural utilization of sewage**
- **The legal/Indicial Prevention of pollution water**

IX. CITIZEN'S CONDUCT RULE; CITIZENS' DUTY OF "FOR CONSERVATION OF ENVIRONMENT

- **Constitution of India grants "Human Right" for a Pollution free atmosphere. Atmosphere consists of Air, Water and Land (Soil).**
- **Present day problem of Environmental Pollution is very deep rooted, its escalation is to the extreme extent. Presently it is such that the Government Machinery (The Bureaucratic Machinery) is insufficient to tackle the Pollution problem.**
- **The laws on the prevention of pollution is not sufficient for the purpose and the judicial machinery is also not adequate so to prevent the Environmental Pollution.**
- **When citizens enjoy the Right of "pollution free environment" by our Constitution, conversely citizens have the duty to keep the Environment clean and pollution free. As such citizens duty charter (conduct rules for citizen) is to be framed, as every citizen is responsible for cleaning the Environment. Environmental Pollution problem has become so acute that Government machineries alone are not sufficient for that so "charter of Duties" and "conduct Rule" to be framed and distributed to citizens for the purpose of "Conservation of Environment" Education.**
- **At the beginning/initial stage it should be on the incentive basis and after that on imposed duty basis. Depending on the response towards "Citizens Duty to the conservation of Environment", light punishment may be imposed/prescribed. Protection of Environment is of utmost importance for the safety of "Human Being" and all other living creatures and even non –living creatures.**
- **It is nevertheless important that "Environment-Protection", "Environment-Conservation" education is to be introduced in school level.**

X. CONSTRUCTION OF CIRCULAR DRAIN FOR DRAINING ALL SMALL DRAINS OF THE CITY AND SEWAGE FROM CIRCULAR DRAIN TO GO FOR TREATMENT

- **"Prevention of water pollution can be possible through "self-help-groups"- which can increase the recreational value of a fishing lake, Beaches, Resort owners, Commercial fishermen and the communities.**

- **Sewage treatment plants, advanced waste treatment methods (chemical coagulation and filtration, carbon adsorption chemical oxidation, ion exchange, electrodialysis, reverse osmosis, air stripping, advanced biological systems) should be used.**

- **Some methods are being used by industry for treating or disposing of waste water that are not having any present counterpart in municipal treatment. Some make use of solar evaporation to help reduce pollution problems but this involves loss of water. Many industries recover valuable by products from their waste water. Use of brine injection wells to dispose of oil field brines.**

- **Reverse osmotic technique is used to recover sodium sulphate from rayon mill effluent. The technique is also used to recover water for reuse. Similarly, 70% of the protein and 80% of the lactose can be recovered from cheese by reverse osmosis which otherwise would cause a serious pollution problem.**

XI. PREVENTION BY THREE PS- POLLUTANTS, PROCESSES, PEOPLE

- **By and large, everyone should adopt.**

1) **Clean coal technology**

2) **Renewable energy strategies**

3) **Fuel efficiency standards**

4) **Low methane farming everywhere in India.**

5) **In India there is no shortage of Man Power. There is lack of proper deployment. Plenty of cream retired personnel from Public Services are readily available and their excellent services as volunteers can be channellised for useful purpose of checking the menace of water pollution, at every level of area. For such purposes "Citizen Police" & "Social audit" will do better.**

6) **Supreme Court appointed Monitoring Committee (EPCA) is already working under "Ministry of Environment & Forests". The area of Community participation at village/town/city levels in checking the menace of water pollution can be entrusted to this committee by turning into a full-fledged permanent constitutional body.**

7) **Rain water harvesting should be made compulsory.**

8) **In case of any default, water connection should be cut off. That is what has been done in Tamil Nadu. All the states should make it compulsory and this should be on paper, whether it has been implemented or not should be taken care of.**

XII. TREAT FACTORY /COMPANY AND MUNICIPAL SEWERAGE

- Management of Municipal Sewage
- Ban on fertilizers and pesticides Agriculture lands
- Control pollution from Ocean- Ship-generated pollution is a source of concern since a typical 3,000 passenger.

  At least control ship generated pollution and municipal sewage, garbage (like Mumbai) and Oil refineries pollution at Indian coastline.

- Constructed wetlands
- Use advanced technologies for water and waste water treatment:

  1. Filtration types
  2. Micro filtration
  3. Ultra filtration
  4. Nanofiltration
  5. Reverse Osmosis

- Mass awareness for Water pollution.
- Conduct for research for water pollution.
  - Urban dirty water is to be purified before entering rivers and lakes.
  - Policy towards borewells to be implemented.
  - Plantation of trees around rivers and lakes.
  - Hydrological profile of the River Yamuna should not be altered. Flood plane Zoning Bill may be enacted.
  - Illegal construction on the river bed must be removed. Water channel of about six hundred meter be left on both banks, trees to be planted.
  - Water pondage level be raised to RL 210.800 M; RL 204.500 M and RL 202.700 M upstream of Wazirabad Barrage, Yamuna Barrage and Okhla Barrage respectively.

- Regulatory Tribunal must be created. Polluters be punished under criminal laws.
- Bring water in the concurrent list.
- Create a force called "environmental police" for controlling and monitoring water pollution
- Make new national water quality policy.
- Organize a national symposium to assess the current status of water quality and disseminate the data to the grass root level.
- State Government to create a special data infrastructure (SDI) designated as Quality Spatial Data for uploading the water quality data and made available to the public through village resource centers.
- Awareness programmes.
- Water quality Monitoring has to be strengthened.
- Establish well equipped labs especially for bacteriological analyses.
- Apply natural pesticides and fertilizers.
- Dispose of toxic products with care.
- Arousing public consciousness and civic sense.
- Stringent exemplary punishment against not only the concerned violators but also the concerned authorities in default.
- Compulsory treatment of all the outlet systems to River/Canal or even Sea sources.
- End to open air Latrines, washing, cleaning Bathing, immersion of idols directly in the source of streams.
- Regulated plantation with maintenance of the same by local resident groups along both sides of streams.
- Removal of unauthorized occupations/ erections from sides and beds of water source.
- Periodical pollution tests.
- Strict enforcement of the directions given by the Supreme Court in its judgement on Vellore citizens welfare Forum vs. Union of India and other.

- Assessing the havoc caused by the tanneries, dyeing and bleaching industries and awarding compensation in case of default by the Loss of Ecology (Prevention and Payment of Compensation) Authority.
- Exercising its powers by the Ambur Municipality as per the provisions under section 226-231, 249-253 and 338 to 342 of Madras District Municipality Act, 1920.
- Exercising the powers under Section 63 of the Water (Prevention and Control of Pollutions) Act, 1974 in the case of tanneries in Ambur and the surrounding areas.
- Establishment of Treatment Plants in the lines of Plants established by Tamil Nadu Leather Development Corporation TALCO.
- Educating the affected persons about the fruitful benefit of section 133 Cr.PC.
- Filing PIL in the form of writ against the tanners for discharging untreated effluents and against the Government for implementing provisions of Water Act and Air Act.

XIII. POLLUTION PREVENTION ACTIVITIES

- Appropriate use of solid waste disposal.
- Project should have local geology knowledge to assess the probability of groundwater contamination.
- Rain water harvesting pollution control.
- Regular water quality testing.
- Use of organic farming.
- Arrange agricultural field school, field trips, form a society with stakeholders and other communities available in the village.

XIV. CONSERVATIONAL TECHNIQUES:

- Practising strip cropping, contour ploughing, crop rotation, pasture management etc.
- Animal waste control system.
- Erosion control practice.
- Material storage and runoff control facilities.
- Pesticide and fertilizer application restrictions.
- Public education program.

XV. MANAGEMENT ACTIVITIES FOR LONG-TERM SUSTAINABILITY

- Public education and outreach through band out materials.
- Public involvement – meetings, skit.
- Construction site runoff control.
- Water once extracted from rivers or underground for industrial use must be recycled and not permitted to be drained back into water bodies.
- Grey (waste) water for human consumption should after proper treatment be recycled for non potable human uses.
- Promotion of **eco-san toilets** that do not permit mixing of human feaces and urine and instead convert them into useful natural manure and insecticide.
- System of local stewardship of water bodies like ponds, wells, nalas, and rivers.
- Security of ground water sources.
- Use of Effective Microorganism (EM) method for cleaning and recycling in villages and towns.
- Use of Effective Microorganism (EM) method for sewage treatment in cities.

- Sewage to empty itself into Mini Floating Sewage plants placed along the length of the Water Body.
- Construct Lock Gates to disallow the flow of the waste for removal to Land based Disposal Areas.
- Set up Low Cost Sanitation Facilities and route the Open Defecation Waste to the Mini Floating Sewage Plants or use the same to create Bio gas and Manure/ Fertilizers.
- Offer Promotional Incentive Schemes.
- Create an Industry for Re-cycling certain materials instead of disposing the same.
- Criteria for common effluent treatment pants (CETPs) as well as Treatment storage and disposal facility site (TSDF).
- TSDF site to be within 100 km of distance of the project only due to the risk associated with transportation of hazardous waste.
- Effluent Channel Project (M/s ECPL) not be granted permission for further expansion until the criteria of disposal of Gujarat Pollution Control Board is achieved.
- Common effluent treatment plants and sewage treatment plant should conduct environmental impact assessment study.
- Government authority should regularly monitor whether CETPs are functioning properly and the effluent reaching CETP and final ETPs confirm to the norms.
- The infrastructure and technologies of treatment plant should be strengthened.
- Complete assessment and quantification of contaminants.

- Wastes and garbages have to be removed from the sides of canals, tanks and rivers.
- Water bodies have to be desilted, weeds removed.
- Treatment of used water before allowing to run into the main stream.
- Wastage of the Dyeing units be treated at the common effluent treatment plants.
- Collection of recyclable wastes.
- Branch of National Green Tribunal be opened at all State Capital.
- User of organic fertiliser and pesticide for agriculture purpose be given pension from L.I.C.
- Following steps be taken by government to control population as rapid growth of population leads to water pollution

  - Reward facilities for one child couple.
  - Reward facilities for two child couples.
  - Facilities to be stopped for above two child couple.

- Efforts and dedication by individual, groups, communities and industries.
- Use of phytoremediation using Prosopis juliflora for combating floride pollution in water.
- Rainwater harvesting should be made compulsory and in case of default there, water connection and drainage connection should be cut.
- Implementing the laws properly.
- No Discharge of Treated or Untreated Effluents.
- Maintenance of the Flow of Rivers.
- Revised effluent Discharge Standards.
- Promotion of SRI and Organic Farming.
- Agricultural Pollution correction.
- Increase in Sewage Treatment Plant Capacity.
- Strengthening the Existing Monitoring System.
- Adopting a more Stringent Polluter Pays Approach.
- Independent Environment Impact Assessment.
- Informal Regulation and People's Participation.
- Protection of rivers and abatement of pollution to be made an election mandate.
- Immersion of Idols in rivers, lakes, Sea must be stopped.
- Pouring drainage waste in river water be stopped
- Disposing Corpses in river, lake, well must be stopped.
- Washing Animals, clothes, utensils in the river, lake must be stopped.
- Dredging sands from river, lakes, sea are to be stopped.
- Central and State Governments need to stop the 'technology upgradation funds' and other subsidies extended to the Tanneries unless zero discharge level is obtained.

- Civic bodies need to follow effective ways to recycle waste water.
- Effective implementation of legislation to ban plastics.
- Government must take measure to protect encroachment of river bed.
- Traditional management of water bodies.

Basic solutions

- Efficient and effective designing of the treatment plants.
- Efficient and technically skilled staff.
- Strict implementation of Water Act.

Technical solutions

- Use of advanced wastewater treatment technologies through membrane filtration like Membrane Bioreactor (MBR), Advanced Oxidation Processes (AOP).

Legislation

- Water Pollution Control Act for prompt and exemplary compensations to the affected people at the cost of the polluters.
- Amend the Environment (Protection) Act, 1986 to link penalties for violation.
- Amend Environment Impact Assessment notification where any activity that would affect the water bodies adversely will require Environment clearance and EIA.
- Enact Clean Water Act to include right to water and protection of natural water bodies.

Institutions

- Institutions involved in water pollution control must have for its monitoring function a committee with about 50% of the members from outside the government including NGO, affected community members, media and eminent citizens.
- Fund should not be released without formation of such a committee for any project.
- Use of all forms of plastics and aluminium foil must be banned right away.
- Government must come out with a policy in conjunction with manufacturers of bottles or suppliers for recycling these plastic bottles.
- Improvement of the local transport facilities.
- Water harvesting from the condensed water from Air conditioner.
- Sewage entering the rivers has to be checked.
- Water resources capacity augmentation by desilting of dams, lakes and ponds and investing in Rain water harvesting structures.
- Address the issue of proper water supply, distribution and also waste water drainage systems so that a correct basic design of treatment plant can be proposed.
- Recycling of waste water as an alternate source of water that can be treated and reused for non potable purpose, operated and maintained by the community.

- Cost recovery from the reusing community.
- Aquifer mapping.
- Information and extension programme for scientific application of agro chemicals.
- Use of GIS and Remote Sensing based Decision Support Systems.
- Increase in the wastewater treatment capacity and its optimum utilization.
- Regulations to deal with water pollution from households, commercial infrastructure and agricultural sector.
- Increase the water quality monitoring network.
- Making the best available technology for waste water treatment affordable to the Micro, Small and Medium Enterprises (MSMEs).
- Measures instituted to sensitize the students about environment issues including the need for preventing water pollution.
- Incorporated various topics related to Water Pollution and its prevention for the Upper Primary, Secondary and the Higher Secondary Stages by NCERT.
- Schools have been advised to set up Eco Clubs vide Circular No. 16 dated 12.06.2001 by CBSE.
- The CBSE Teachers' Manual on Environmental Education from Classes I to VII has included topics on climate change and Global Warming.
- CBSE organized National Urban Water Awards.
- Organizes CBSE Annual Science Exhibition which includes theme of Water Conservation.
- Sewerage treatment plants for cities and villages.
- Cancellation of Licence, subsidy, permission for not having sewerage/water treatment plants for factories and industries.
- Punishment to factories owner for allowing contaminated water to flow into streams/rivers.
- Treatment plants for Solid waste in cities.
- A concerted attempt to mitigate the fluoride pollution in drinking water as a welfare measure to improve the quality of life and people in North East Region.
- Monitoring of all water supply system to minimize the potentially harmful levels before it reaches common people.
- Pollution prevention coupled with job opportunity to attract more people.
- Weeds such as 'Kai' (Hindi name) to be removed to reduce water pollution.
- Prevent recurring incidents of cloudburst by deploying mobile vehicles mounted with meteorological magnet to disperse Nimbostratus clouds/other clouds with iodine seeding therein.
- Arrangement for uninterrupted irrigation of crops in the Indian region.
- Identify the places of water pollution out of garbage in cities and do water sampling there.

- Set up biological banks from bacterias/fossils useful for biological war in manufacturing medicines by developing their resistance power.
- Seek suggestions from students of medical/engineering colleges to tackle biological war.
- Disposal of sewage of big cities at a distance of minimum 7 nautical miles away in sea with the help of dredger ships.
- Meet the challenge of water pollution due to extraction of metal and petroleum from the sea.
- Independent government systems with latest equipment that do not buckle under industrial and political powers.
- Eminent persons in respective fields to voluntarily register with the Govt. and to give feedback about the causes of pollution and possible solution.
- Pollution control office must certify on their website every month about the expected quality parameters of industrial effluent and actual quality parameter of industrial effluent.
- Industries to deposit certain amount with the Govt. every month based on the pre-decided criteria. Suitable investigation / action be taken including forfeiting their amounts deposited in case of more than ten complaints by eminent person.
- Special emphasis on importance of cleanliness of water bodies, personal and social discipline to be followed to avoid pollution of water bodies.
- Practical Training and visit to unclean and polluted places.
- Religious heads to educate masses or change the existing practices.

Ground water pollution

- Find out ways of using natural ingredients in pesticides which are not harmful to humans or animals.
- Proper mechanism to check the arrangements being put in place by industries before they get license and monitor their activities from time to time.
- Proper sewage system and its treatment before that water is released to the natural drainage channels.

River Water Pollution

- Make a profile of the river.
- Stop the flowing of drains directly to the river.
- Making people aware about the pollution being caused by cultural traditions and evolving ways and modified rituals that will satisfy the people emotionally.
- Construction of Six-lane Expressway.
- Corridor for installation of Solar Panel.
- Green corridor.
- Polythene bags should be totally banned all over the country.
- All the house owners to construct Septic tanks within their respective premises.

- India-wide programme to mobilize communities and Panchayats for inclusive management of water resource.
- Constituting and promoting community driven interventions or programs to mitigate surface and ground water pollution and encouraging water conservation.
- Promoting long term programmatic interventions for education, awareness and capacity building of local communities.
- Setting up of an ICT (Information and Communication technologies) based on MIS (Management information system) at village, district and state level.
- Exploring different models of partnership in managing pollution.
- Regular training and capacity building of the stakeholders involved at all tiers.

Laws

- More stringent clearances like the absence of any water pollution points/sources, full availability and effective functioning of installed apparatus for the treatment of the waste water/industrial waste etc. should be available with the seller for the transfer to take place of industrial set ups.
- Rotational monthly check up of residential/commercial/industrial complexes for checking the probability of leakages.
- Controlling electricity for tube well farming according to the season of the crop to prevent the out of track sowing of crops by farmers.

Interaction and awareness

- Annual scholarship/competition regarding water related essays/paintings/dance/plays etc. competitions.
- Creation of an online forum to bridge the gap and increase the publicity of different water programs.
- Introduction of a national/international water-fest where different minds meet, and where people can showcase their talents, research, accomplishments etc.
- Promotion of a very powerful force in the Indian culture which is the spiritual organizations for spreading the message.

Most important

- Increased spending on Research and Development in this specific field, as the research involved is one time investment and effective collaboration with foreign government or NGOs.
- Creation of a separate agency of professionals for inviting different water related projects.
- The setting up of different varieties of plants which can purify pollutants according to the different level of pollutants present in different parts of the country.

- Educating the Public with regard to
    - the problems due to water pollution.
    - the differences between drain mechanisms - sewage, storm water drain, canals.
    - steps to prevent sewage from reaching storm water drain.
    - steps to reduce the amount of sewage generated, through gray water re-cycling.
    - Use of every possible medium to educate the public.

Draft Model Bill for the Conservation, Protection and Regulation of Groundwater, 2011 was enclosed.

Educative and social awareness

- People should be made aware of the depleting quality of water and its growing demand.
- Environmental subject be included necessarily from class one to Post Graduation.

Change in Life Style

- Use pure water only when it is necessary.
- Use of plastics should be minimized and disposed in such a manner that it does not enter into reservoirs, rivers etc.

Disposal of polluted water of the towns and Industrial units

- Prevent effluents coming out of industrial factories to mix in pure water.
- Framing strict laws.
- Plants to treat polluted water be established at various places.

Role of Panchayats in the prevention of water pollution

- Gram Panchayats should be given an important role to tackle the problem of pollution in the villages with guidelines.
- Gram Panchayats should frame schemes locally for the prevention of pollution.
- Regularly evaluating and reviewing the schemes by framing Gram Samiti.
- Making public aware and providing proper assistance with voluntary labour service.

- Panchayats should impart unemployed young men and women a special training at Panchayat level.

`Land and Water conservation

- Making water shed.
- Treatment of water by making big reservoirs of water and intensive farming.

Land excavation should be planned

Safe disposal of fly ash

- Fly ash emanating from thermal power stations should be properly disposed.

Proper disposal of effluents emanating from Industrial plants and impure water of cities

- Strict rules should be made and enforced and the contaminated water be treated physically, chemically and biologically.

Limited use of pesticides and insecticide chemicals in agriculture produce

- Use of bio and herbal medicines be promoted.
- Integrated Pest Control technique be adopted which is cheap and simple.

Awareness about water pollution in religious festivals and melas.

- Proper disposal of waste material left in big religious festivals.
- Special care should be taken about the cleanliness of bathing places on the bank of holy rivers and reservoirs.
- Establishing 'National/Night Shelter and Community Kitchen Authority'.
- Give priority to horticulture before industrialization.
- Gardens should be developed in the small towns instead of district headquarters.
- The Government should evolve the mechanism to allow capitalist class to invest in horticulture.
- Arrangement for providing bio toilets in 19000 trains running across India.
- There should be tanks where used water of washbasin could be stored and utilize in flush toilets after treating it.
- Effective steps for arrangement of potable water in trains and passengers by the Railway Organisation.
- Appointing Safaiwalahs (Sanitary Workers) in adequate numbers.

- Mobile Toilet Bathrooms should be arranged in every districts by the Government which could be used in social/religious occasion.
- Separate sewage line for the excrement of hotels etc. opening at safe place away from the cities.
- Formulation of Law to encourage people construct soak pit for their houses.
- Use of polythene should be banned and garbage should not be dumped here and there.
- Awareness of the people of the ill-effects of polythene and garbage.

- Non-potable water should be supplied through pipelines.
- Drains linked directly to rivers should be treated by the construction of sewage treatment plants.
- Copper plates should be installed in 5 feet, 4 feet, 3 feet, 2 feet and 1 feet deep pits and drainage wastes should be routed into the rivers through pipes.
- PVC pipes be used for drip irrigation and sprinkling.
- Taps should not be left running in the public toilets.
- Public awareness programmes should be organized at city and state level for judicious use of water.
- Selling of milk and water in poly bags and plastic bottles should be banned.

- Awareness among the people and a feeling of public welfare to depollute the environment putting aside all our reservations.

- Clean water under article 51A(g) of the Constitution of India.

- Water should be used as per requirements.
- Drinking water should be well covered.

- People should not be allowed to throw dead bodies of animals in the rivers or ponds.

- Plastic items should be banned at religious places which are adjacent to rivers.
- No habitation should be allowed on the banks of the rivers.

- Companies manufacturing various products of daily use should ensure that their products have no harmful chemicals and are totally eco-friendly.
- Plastics products should be banned immediately and green technology should be developed.

- Labourers should not be allowed to live on the banks of rivers and the administration should arrange for their habitation.
- Dams should not be constructed on rivers and allowed to flow without any hindrance.

- Unnecessary construction work should not be carried out on the banks of rivers.
- Use of soap by people bathing in religious spots should be banned.
- Plantation of trees which soak extra water like pine tree which causes maximum loss to the land should be stopped.
- People should not be allowed to throw jewellery and coin in rivers.

ANNEXURE III

DETAILED NOTE ON THE MEASURES INSTITUTED BY THE DEPARTMENT OF SCHOOL EDUCATION AND LITERACY TO SENSITIZE THE STUDENTS ABOUT ENVIRONMENT ISSUES INCLUDING THE NEED FOR PREVENTING WATER POLLUTION

The National Council of Educational Research and Training are apex organizations in School Education and the Central Board of Secondary Education under the aegis of Ministry of Human Resource Development. Measures instituted by both the organization are detailed as under:

A. National Council of Educational Research & Training (NCERT)

National Council of Educational Research & Training (NCERT) has incorporated various topics especially related to Water Pollution and its prevention at relevant chapters and section in the textbooks and other curricular material developed by the Department for the Upper Primary, Secondary and the Higher Secondary Stages to sensitize impressionable minds of students. A list of Topics especially related to water pollution and its prevention in NCERT's Textbooks is attached.

B. Central Board of Secondary Education(CBSE)-

1. The Central Board of Secondary Education has taken cognizance of the importance of Environment Education long back. The schools have been advised to set up Eco Clubs as far back as 2001 vide **Circular No. 16 dated 12.06.2012.** The Board has given directions to all its affiliated schools to impart Environment Education integrated in different subjects in all classes from I-X through the activity mode to sensitize students to global warming and other environment related concerns.

2. Directives have been sent to schools from time to time to impart education to students about environmental issues and concerns and initiate necessary action about environmental protection. The CBSE prescribes the syllabus in Environment Education that has been prepared by NCERT.

3. CBSE brought out the two Manuals as support material to help teachers in effective transaction of the curriculum i.e. **Guidelines for teachers for Classes I to VIII: An activity based manual.** These Manuals consist of graded activities related to environmental issues and concerns.

4. The **Teachers' Manual** on Environmental Education from **Classes I to VIII** has the following activities on Climate Change and Global Warming (copies enclosed):
   a. Water Cycle in Nature (Page No. 71)

b. Purifying Water by Solar Energy (Page No. 77)
c. How Plants Modify the Environment (Page No. 81)
d. Green House Effect (Page No. 87)

5. Similarly in the **Training Manual For Class IX,** there are various activities such as:

a. Water Conservation (Page No. 20)

6. There is a section on Eco Clubs in the quarterly journal CENBOSEC published by the Board. The Board sensitizes schools about water management by providing useful links and information under this section. The CENBOSEC issue October-December 2009 provided information regarding the India Water Portal (www.indiawaterportal.org) which is an open, inclusive, web-based platform for sharing water-management knowledge amongst practitioners and the general public. It aims to draw on the storehouse of traditional and modern practices, use technology tools like GIS and multimedia to add further value to it and then disseminate it to a larger audience through the internet.

7. The CBSE organized National Urban Water Awards (NUWA) in the year 2010. The objectives of the programme were:-

- To ensure Water Conservation and its Judicious Use
- To create awareness regarding Safe drinking water and its upkeep
- To create awareness regarding establishment of Water Harvesting Structure
- To ensure Waste Water Recycling in Schools
- To create awareness regarding Conservation of Green Spaces

8. The Board has also started National School Sanitation initiative along with Ministry of Urban Development and GIZ. The programme encourages schools to practice Water Conservation through activities such as Rain Water harvesting and Waterless Urinals.

9. The CBSE organizes CBSE Annual Science Exhibition which often includes theme of Water Conservation. The exhibition witnesses many projects by students on issues related to Water even from other themes.

10. The CBSE has also given weightings to the activities conducted under Eco-clubs, Health and Wellness clubs and other extra-curricular activities under the School Based Assessment. This would, among other things, also result in promoting various issues such as Water Conservation.

11. As a result of these initiatives many schools in different parts of the country have reportedly started activities that lead to water conservation.

List of Topics related to Water Pollution and its prevention in NCERT's Textbooks

Sl. No.	Name of the Book & Class	Chapter Number & Name	Sections	Page Numbers
1.	Science for VII	18 - Wastewater Story	introduction	
			18.1: Water, Our Lifeline	220
			18.2: What is Sewage - Activity 18.2	221
			18.3:Water Freshens Up - An Eventful Journey - Sewers and sewerage - Activity 18.3 on study of sewage route - Treatment of polluted water - Activity 18.4 on simple way of water treatment	221-223
			18.4: Wastewater Treatment Plant - Detailed process of wastewater treatment	223-224
			18.6: Better House Keeping Practices	225
			18. 7: Sanitation and Disease	225-226
			18.8: Alternative Arrangement for Sewage Disposal	226
			18.9: Sanitation at Public Places	226-227
			Extended Learning - Visit of sewage treatment plant	229

2.	Science for VIII	18 - Pollution of Air and Water	Introduction	235
			18.6: Water Pollution - Water pollutants	245
			18.7: How Does Water Get Polluted? - Case study on the river Ganga	245-247
			18.8: What is Potable Water and How is Water Purified? - Activity 18.7 on construction of water filter with simple, everyday materials	247-248
			18.9: What Can be Done? - Activity 18.8 suggesting projects which include investigation on awareness about water pollution, methods of sewage disposal, common water-borne diseases, governmental and NGOs working in this field	248-249
			Extended Learning - Activities and Projects - Field visit to a river in or around the town with the help of teachers	251-252
3.	Science for IX	14 - Natural Resources	14.2: Water: A Wonder Liquid	193
			14.2.1: Water Pollution - Fertilisers, Pesticide, Sewage, etc.	194
4.	Science for X	16 - Management of Natural Resources	Introduction	266
			Box item on Pollution of the Ganga	267
			Activity 16.3 on testing of water samples	268
5.	Biology for XII	16 - Environmental Issues	16.2: Water Pollution and its Control	273
			16.2.1: Domestic Sewage and Industrial Effluents - Effects of sewage discharge - Eutrophication	274-277

			16.2.2: A Case Study of Integrated Waste Water Treatment - An integrated mix of artificial and natural processes for water treatment in Arcata, California	277-2
6.	Project Book in Environmental Education for Class VIII	1 - Elixir life - water	Project on water pollution in a locality	2-3
7.	Project Book in Environmental Education for Class IX	17 - Quality of water	Project to test polluted water samples	34-3
8.	Project Book in Environmental Education for Class X	12 - Water bodies in the neighbourhood	Project on sources of water pollution	24-25
9.	Teachers' Handbook on Environmental Education for the Higher Secondary Stage	5 - Geosphere	5.3: Management of Gaseous, Solid, Liquid and Hazardous Wastes	116-11
			5.4: Air, water (fresh and marine), soil pollution - sources and consequences	118-12
			5.9: Strategies for Reducing Pollution and Improving the Environment	137

LIST OF ACRONYMS AND TECHNICAL TERMS USED IN THE REPORT

CGWB	Central Ground Water Board
CPCB	Central Pollution Control Board
Cr.	Crematoria
DPR	Detailed Project Report
FAB	Fluidized Aerated Bed
I&D	Interception and Diversion
JNNURM	Jawaharlal Nehru National Urban Renewable Mission
LCS	Low Cost Sanitation
mld	Million liters per day (a measure of water quantity).
MoEF	Ministry of Environment and Forests
MoUD	Ministry of Urban Development
MoWR	Ministry of Water Resources
MPS	Main Pumping Station
NGRBA	National Ganga River Basin Authority
NLCP	National Lake Conservation Plan
NRCD	National River Conservation Directorate
NRCP	National River Conservation Plan
O&M	Operation and Maintenance
RFD	River Front Development
SPCB	State Pollution Control Board
STP	Sewage Treatment Plant
SWM	Solid Waste Management
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
UNEP	United Nations Environment Programme
WQAA	Water Quality Assessment Authority
WQRC	Water Quality Review Committee
Baseline stations	An essential part of water quality monitoring systems, baseline stations are established in areas away from human influence, these give data for comparison purposes.

Basin approach	River and lake basins are dynamic over space and time and any single management intervention has implications for the system as a whole. Increasingly, human activities are impacting the ecological integrity of lakes. Basin approach is a way of thinking that assists Basin managers and stakeholders in achieving sustainable management of rivers and lakes and their basins. It takes into account that rivers and lakes have a great variety of resource values whose sustainable development and use require special management considerations for their static water properties.
BOD	BOD is a chemical procedure for determining the uptake rate of dissolved oxygen by the biological organisms in a body of water and is widely used as an indication of the quality of water.
Bio-indicators	Biological monitoring goes beyond the conventional measures of water quality to address questions of ecosystem function and integrity. It involves the measurement of species or a group of species like invertebrates whose population is used to determine environmental integrity
DDFU	Domestic Deflouridation Unit
DO	DO is a relative measure of the amount of oxygen that is dissolved or carried in the water body. Adequate dissolved oxygen is needed and necessary for good water quality.
Flux/Impact stations	An essential part of water quality monitoring systems, flux stations determine fluctuations of critical pollutants from river basin to ocean or regional sea.
Keystone species	A keystone species is a species so critical to an ecosystem that its removal could potentially destroy the entire system. The concept of keystone species has become an important issue in conservation today as the loss or decline of

	keystone species may have far-reaching consequences for the structure and functioning of the eco-systems in which they live.
MINARS	Monitoring of Indian National Aquatic Resources (MINARs) programme established by CPCB
Non-Point source pollution	It occurs when pollutants are delivered indirectly through transport or environmental change. Non-point sources are much more difficult to monitor and control. Today they account for the majority of contaminants in ground water streams and lakes.
Point source pollution	It occurs when harmful substances are emitted directly into a body of water. Point source pollution is easier to monitor and regulate.
TC	Total Coliform which is an indicator of presence of fecal matter in water.
Trend stations	An essential part of water quality monitoring systems, the purpose of trend stations is to test for long-term changes in water quality and identify trends of pollution.
UASB	Upflow Anaerobic Sludge Blanket, a technology for treatment of effluents from sewage treatment plants.
GAP	Ganga Action Plan
RRL	Regional Research Laboratories
PPP	Public Private Partnerships
CANR	Committee on Allocation of National Resources
PCCs	Pollution Control Committees
ESS	Environmental Surveillance Squad
CETP	Common Effluent Treatment Plant
EIA	Environment Impact Assessment
NAEMA	National Environmental Appraisal and Monitoring Authority
IPM	Integrated Pest Management
FFS	Farmers Field School
BWE	Bureau of Water Efficiency
IWRM	Integrated Water Resources Management

UPWQM	Uniform Protocol on Water Quality Monitoring
WQRC	Water Quality Review Committees
TOR's	Terms of Conditions
WQMP	Water Quality Management Plan
WQRC	Water Quality Review Committees
SLBMs	Standardized Service Level Benchmarks
UWSS	Urban Water Supply and Sanitation
HPEC	High Powered Expert Committee
NUSP	National Urban Sanitation Policy
COD	Chemical Oxygen Demand
NERUDP	North Eastern Region Urban Development Programme
CSMC	Central Sanctioning and Monitoring Committee
QPR	Quarterly Progress Report
IRMA	Independent Review and Monitoring Agency
PIU	Project Implementation Unit
PMU	Project Monitoring Unit
IPCC	Investment Programme Coordinator Cell
NSC	National Steering Committee
SIPMIU	State Investment Programme Management and Implementation Unit
NRSC	National Remote Sensing Centre
NPOF	National Project on Organic Farming
NPMSH&F	National Project on Management of Soil Health & Fertility
DAC	Department of Agriculture & Cooperation
SLTP	Season Long Training Program
ICAR	Indian Council of Agricultural Research
SAUs	State Agriculture Universities
DPPQ&S's	Directorate of Plant Protection, Quarantine & Storage's
DBT	Department of Bio-Technology
ICMR	Indian Council of Medical Research
RKVY	Rashtriya Krishi Vikas Yojana
NHM	National Horticulture Mission
HMNEHS	Horticulture Mission for North-east and Himalayan

	States
ZLD	Zero Liquid Discharge
NEERI	National Environmental Engineering Research Institute
PIAS	Pollution Inventorization, Assessment & Surveillance
GPI	Grossly Polluting Industries
NMCG	National Mission for Clean Ganga
SPMGs	State Programme Management Groups
GKC	Ganga Knowledge Centre
CMCs	City Level Monitoring Committees
SGRCA	State Ganga River Conservation Authority
SRCA	State River Conservation Authority
DBO	Design, Build & Operate
TPI	Third Party Inspection
FR	Feasibility Report
DBU	Designated Best Use
ICT	Information-Communication-Technology
DPMC	Divisional Project Monitoring Cell
GIS	Geographical Information System
ULBs	Urban Local Bodies
CPOP	Communication and Public Outreach Program
NYKS	Nehru Yuva Kendra Sangthan
NEAC	National Environment Awareness Campaign
IEC	Information, Education and Communication
AESA	Agro Eco-System
CIPMCs	Central Integrated Pest Management Centres
NGOs	Non-Governmental Organizations
VOs	Voluntary Organisations
PRI	Panchayati Raj Institutions
IIT	Indian Institute of Technology
TSDF	Treatment Storage Dsposal Facility
CCEA	Cabinet Committee on Economic Affairs
PHED	Public Health Engineering Department
CIPMCs	Central Integrated Pest Management Centres
CSP	City Sanitation Plan

CDP	City Development Plan
LDA	Land Development Authorities
IAs	Implementing Agencies
UC	Utilisation Certificates
NEP	National Environment Policy
IC	Improved Crematories
WHO	World Health Organisation
YAP	Yamuna Action Plan
WRIS	Water Resources Information System
MOAs	Memorandum of Agreements