

5

STANDING COMMITTEE ON WATER RESOURCES

(2015-2016)

SIXTEENTH LOK SABHA

MINISTRY OF WATER RESOURCES, RIVER DEVELOPMENT AND GANGA
REJUVENATION

REVIEW OF GROUND WATER SCENARIO, NEED FOR A COMPREHENSIVE POLICY
AND MEASURES TO ADDRESS PROBLEMS IN THE COUNTRY
WITH PARTICULAR REFERENCE TO (I) DARK BLOCKS; AND
(II) CONTAMINATION OF UNDERGROUND WATER BY
CERTAIN INDUSTRIES

FIFTH REPORT



LOK SABHA SECRETARIAT
NEW DELHI

December, 2015/Pausha, 1937 (Saka)

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CERTAIN INDUSTRIES

Presented to Lok Sabha on 22.12.2015

Laid on the Table of Rajya Sabha on 22.12.2015



LOK SABHA SECRETARIAT
NEW DELHI

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COMPOSITION OF THE STANDING COMMITTEE ON WATER RESOURCES

(2015-2016)

Shri Hukum Singh - Chairperson

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LOK SABHA

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3. Shri Devusinh Jesingbhai Chauhan
4. Shri Sukhbir Singh Jaunpuria
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31. Shri Lal Sinh Vadodia

(iii)

SECRETARIAT

- | | | | |
|----|------------------------|---|----------------------|
| 1. | Shri K. Vijayakrishnan | - | Additional Secretary |
| 2. | Shri Shiv Kumar | - | Joint Secretary |
| 3. | Smt. Rita Jaikhani | - | Director |
| 4. | Shri Kushal Sarkar | - | Additional Director |
| 5. | Shri Ginsuanlian Guite | - | Committee Officer |

INTRODUCTION

I, the Chairperson, Standing Committee on Water Resources (2015-16) having been authorised by the Committee to submit the Report on their behalf, present the Fifth Report on "Review of Ground Water Scenario, need for a comprehensive policy and measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries."

2. The Committee (2014-15) took up the subject "Review of Ground Water Scenario, need for a comprehensive policy and measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries" for a detailed examination and Report. The Committee took evidence of the representatives of the Ministry of Water Resources, River Development and Ganga Rejuvenation, Ministry of Environment, Forests & Climate Change, Ministry of Rural Development, Ministry of Urban Development, Ministry of Drinking Water & Sanitation, Ministry of Commerce & Industry, and Ministry of Agriculture on 27 January 2015, 16 February 2015, and 26 May, 2015.

3. The Report was considered and adopted by the Committee at their sitting held on 17 December, 2015.

4. The Committee wish to express their thanks to the representatives of the Ministry of Water Resources, River Development and Ganga Rejuvenation, Ministry of Environment, Forests & Climate Change, Ministry of Rural Development, Ministry of Urban Development, Ministry of Drinking Water & Sanitation, Ministry of Commerce & Industry, and Ministry of Agriculture for providing the requisite written information and for depositions made in connection with the examination of the subject.

5. The Committee would also like to place on record their sense of deep appreciation for the assistance rendered to them by the officials of the Lok Sabha Secretariat attached to the Committee.

NEW DELHI
17 December, 2015
26 Agrahayana, 1937 (Saka)

HUKUM SINGH,
Chairperson,
Standing Committee on Water Resources

CHAPTER - I

INTRODUCTORY

Our country is endowed with a rich and vast diversity of natural resources, water being the most precious of them. Water is a part of the larger ecological system. Appreciating the importance and scarcity attached to fresh water, it has to be treated as an essential environment for sustaining all life forms. Availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in a year and varies from 100 millimetre in the western parts of Rajasthan to over 10000 millimetre at Cherrapunji in Meghalaya. Rivers and underground aquifers often cut across State boundaries. However, water, as a resource is one and indivisible: rainfall, river waters, surface ponds and lakes and ground water are all part of one system.

1.2 Water security, water management and its development are of immense importance for all walks of human life and also for all living beings. Integrated water management is essential for environmental sustenance, sustainable economic development of the country and for bettering human life through poverty reduction.

1.3 While public investments since Independence have focused largely on surface water, over the last three decades, ground water has emerged as the main source of both drinking water and irrigation, based almost entirely on private investments by millions of atomistic decision-makers. Ground water is the backbone of India's agriculture and drinking water security and is a common-pool resources (CPR), used by farmers across the country. It remains the only drinking water source in most of India's rural households and many industries too depend upon it.

Over the last four decades, around 84 per cent of the total addition to the net irrigated area has come from ground water. India is by far the largest and fastest growing consumer of ground water in the world. But ground water is being exploited beyond sustainable levels and with an estimated 30 million ground water structures in play, India may be hurtling towards a serious crisis of ground water over-extraction and quality deterioration situation.

1.4 Apart from ground water depletion, the pollution of ground water due to industrial effluents and municipal waste in water bodies is a major concern in many cities and industrial clusters as well as areas on their periphery. A survey undertaken by the Central Pollution Control Board (CPCB) in 1995 identified 22 sites in 16 States as critical for ground water pollution, the primary cause being industrial effluents. Recent survey undertaken by the Centre for Science and Environment from eight places in Gujarat, Andhra Pradesh and Haryana reported traces of heavy metals such as lead, cadmium, zinc and mercury. The main contaminations in underground water which have been reported in the past are Arsenic, Fluoride and heavy metals, of which Arsenic and Fluoride are more alarming.

1.5 The Government of India has taken some policy initiatives and measures to tackle the ground water scenario in the country which include preparation of a conceptual document entitled 'Master Plan for artificial recharge to ground water in India', taking up Demonstrative Rain Water Harvesting and Artificial Recharge projects in priority area during the 11th Plan, regulatory measures by the Central Ground Water Authority, circulation of a Model Bill to regulate and control development and management of ground water, formulation of the National Water Policy, 2012, promoting awareness programme on water conservation, and various initiatives taken under different Ministries.

1.6 In the course of the examination of the subject, the Committee took evidence of the following witnesses:

- (i) Secretary, Ministry of Water Resources, River Development & Ganga Rejuvenation and Additional Secretary (Chairman, CPCB), Ministry of Environment, Forests & Climate Change, on 27 January, 2015.
- (ii) Secretary, Ministry of Water Resources, River Development & Ganga Rejuvenation and Special Secretary, Ministry of Rural Development and Additional Secretary, Ministry of Urban Development, on 16 February, 2015.
- (iii) Secretary, Ministry of Drinking Water & Sanitation, Additional Secretary, Ministry of Commerce & Industry, and Additional Secretary, Ministry of Agriculture, on 26 May, 2015.

Apart from oral testimony of the witnesses, the Committee obtained background documents from the Ministries of Water Resources, River Development & Ganga Rejuvenation, Environment, Forests & Climate Change (Central Pollution Control Board), Rural Development, Urban Development, Drinking Water & Sanitation, Commerce & Industry and Agriculture. For questions which needed further clarification, post-evidence clarifications and replies were obtained from the respective Ministries.

1.7 The Committee's examination of the subject "Review of Ground Water Scenario, need for a comprehensive policy and measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries" inter-alia include the review of Ground Water Resources – Quantitative and Qualitative Issues, Dark Blocks, Associated Issues and Government Measures, and Contamination of Underground

Water and Government Measures. Further, other related aspects, including the views of the Ministries concerned have been dealt with in the subsequent chapters of this Report.

GROUND WATER RESOURCES – QUANTITATIVE AND QUALITATIVE ISSUES

According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, the Central Ground Water Board (CGWB) carries out periodic assessment of replenishable ground water resources jointly with the respective State Governments. As per the latest assessment (2011), the total annual replenishable ground water resources of the country is 433 Billion Cubic Metres (BCM), and the net annual ground water availability is 398 BCM.

Ground Water Utilisation

2.2 Out of this net annual ground water availability of 398 BCM, the total annual ground water draft in the country is 245 BCM, whereas the overall stage of ground water development is 62% of the net ground water availability. Out of the total annual ground water draft of 245 BCM, the share of ground water being utilized for irrigation and industrial and domestic sectors is 222.36 BCM (90.75%) and 22.71 BCM (9.26%), respectively. The details of State/Union Territory (UT)-wise ground water availability as well as utilization and stage of development in India as provided by the Ministry of Water Resources, River Development & Ganga Rejuvenation is given at Annexure-I.

2.3 On being asked by the Committee about the extent of annual water recharge, both surface and ground water and also natural and artificial recharge, the Ministry informed that as per the latest ground water resources assessment (as on 2011), the annual natural recharge to ground water in the country is around 433 BCM. This includes recharge from rainfall, tanks, ponds, Minor Irrigation structures, surface water bodies, irrigation seepage, etc. Artificial recharge to ground water is being taken up by various Central/ State Government Departments,

NGOs, individuals, etc. No single agency is maintaining the database on quantum of artificial recharge to ground water.

Assessment of Ground Water Resources

2.4 The Ministry of Water Resources, River Development & Ganga Rejuvenation also stated that the assessment of the country's replenishable ground water resources by CGWB has been categorized under different assessment units (Blocks/Mandals/Talukas/Districts), namely 'Over-exploited' (dark blocks), 'Critical' and 'Semi-critical', based on the criteria suggested by the Ground Water Resources Estimation Committee (GEC-1997). Thus, 'Over-exploited' (dark blocks) assessment units cover blocks where the stage of ground water development exceeds 100% and there is significant decline in long-term water level trend in either pre-Monsoon or post-Monsoon period or both. 'Critical' assessment units cover blocks where the stage of ground water development exceeds 90% but is less than 100% and there is significant decline in long-term water level trend in both pre-Monsoon and post-Monsoon period. 'Semi-critical' assessment units cover blocks where the stage of ground water development exceeds 70% but is less than 100% and there is significant decline in long-term water level trend in either pre-Monsoon or post-Monsoon period.

Ground Water Depletion and Shortages

2.5 Apprising the Committee about the ground water situation, the Ministry informed as under:

"Vagaries of Monsoon rainfall resulting into reduced rainfall and exploitation of ground water for irrigation, domestic and industrial purpose in a proportion more than the rainfall recharge are the main factors that have resulted in depletion of ground water in the country."

2.6 The Committee wanted to know the shortages being faced in the country in the ground water sector. To this, the Ministry of Water Resources, River Development & Ganga Rejuvenation submitted as under:

“Based on the categorization of 6607 assessment units (Blocks/Mandals/Talukas/Districts/Firkas) in the country, 1071 units falling in 16 States and 2 UTs have been categorized as ‘Over-exploited’, where the annual ground water extraction exceeds the net annual ground water availability, i.e., stage of ground water development is more than 100%. Significant decline in long term ground water level trend has also been observed either in pre-Monsoon or post-Monsoon or both in these assessment units.”

Ground Water Pollution and Contamination

2.7 The Central Pollution Control Board of the Ministry of Environment, Forests & Climate Change informed that ground water quality is slowly but surely declining everywhere. The Ministry of Water Resources, River Development & Ganga Rejuvenation also informed in a written reply that the Central Ground Water Board monitors ground water quality of shallow aquifers regularly once every year during pre-Monsoon (April/May) and also through various scientific studies taken up from time to time to generate data on regional scale. The analysis of data indicates that in general the ground water is potable except in isolated pockets - where the ground water is contaminated by Arsenic, Nitrate, Fluoride, heavy metals like lead, etc. in some parts of the country. 10 States have excess concentration of Arsenic, 20 States have higher concentration of Fluoride, 21 States have higher concentration of Nitrate, and 15 States have higher concentration of Heavy Metals such as lead, chromium and cadmium beyond norms prescribed by the Bureau of Indian Standards (BIS-2012). This problem was also brought forward before the Committee and discussed during the Study Visit of the Committee to Kolkata and Guwahati from 05 to 09 October, 2015 with the officials of the Central Ground Water Board (CGWB).

2.8 The National Water Policy, 2012, formulated by the Ministry of Water Resources, River Development & Ganga Rejuvenation, laying emphasis on the need for proper ground water resources planning, development and management in the country, states:

“Ground water, though part of hydrological cycle and a community resource, is still perceived as an individual property and is exploited inequitably and without any consideration to its sustainability leading to its over-exploitation in several areas”.

2.9 It also states that the “declining ground water levels in over-exploited areas need to be arrested by introducing improved technologies of water use, incentivizing efficient water use and encouraging community based management of aquifers. In addition, where necessary, artificial recharging projects should be undertaken so that extraction is less than the recharge. This would allow the aquifers to provide base flows to the surface system, and maintain ecology.”

CHAPTER - III

DARK BLOCKS, ASSOCIATED ISSUES AND GOVERNMENT MEASURES

As already discussed, 'Dark Blocks' are 'Over-exploited' assessment units where the stage of ground water development exceeds 100% with significant decline in long-term water level trend in either pre-Monsoon or post-Monsoon period or both. According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, out of 6607 assessment units (Blocks/Mandals/Talukas/Firkas/Districts) in the country, 1071 assessment units falling in 16 States and 2 UTs have been categorized as Over-exploited in 2011. This amounts to 16% of the total ground water assessment units, i.e. 6607.

Distribution of Over-exploited Assessment Units (Dark Blocks)

3.2 The State/UT-wise details of Over-exploited Assessment Units (Dark Blocks) in the country, including 'Critical' and 'Semi-critical' assessment units, are given in the Table below:

Table -1: State/UT-wise details of Over-exploited Assessment Units (Dark Blocks) (including 'Critical' and 'Semi-critical' assessment units in the country)

| Sl. No. | States / Union Territories | Total No. of Assessed Units | Over-exploited | | Critical | | Semi-critical | |
|---------|----------------------------|-----------------------------|----------------|----|----------|---|---------------|----|
| | | | Nos. | % | Nos. | % | Nos. | % |
| | States | | | | | | | |
| 1 | Andhra Pradesh | 662 | 41 | 6 | 7 | 1 | 42 | 6 |
| 2 | Telangana | 448 | 42 | 9 | 8 | 2 | 55 | 12 |
| 3 | Arunachal Pradesh | 11 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | Assam | 27 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Bihar | 533 | 0 | 0 | 0 | 0 | 11 | 2 |
| 6 | Chattisgarh | 146 | 1 | 1 | 2 | 1 | 18 | 12 |
| 7 | Delhi | 27 | 18 | 67 | 2 | 7 | 5 | 19 |

| | | | | | | | | |
|----|----------------------|------|------|----|-----|----|-----|----|
| 8 | Goa | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| 9 | Gujarat | 223 | 24 | 11 | 5 | 2 | 13 | 6 |
| 10 | Haryana | 116 | 71 | 61 | 15 | 13 | 7 | 6 |
| 11 | Himachal Pradesh | 8 | 1 | 13 | 2 | 25 | 0 | 0 |
| 12 | Jammu & Kashmir | 14 | 0 | 0 | 0 | 0 | 0 | 0 |
| 13 | Jharkhand | 210 | 6 | 3 | 0 | 0 | 5 | 2 |
| 14 | Karnataka | 270 | 63 | 23 | 21 | 8 | 34 | 13 |
| 15 | Kerala | 152 | 1 | 1 | 2 | 1 | 23 | 15 |
| 16 | Madhya Pradesh | 313 | 24 | 8 | 4 | 1 | 67 | 21 |
| 17 | Maharashtra | 353 | 10 | 3 | 2 | 1 | 16 | 5 |
| 18 | Manipur | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 19 | Meghalaya | 7 | 0 | 0 | 0 | 0 | 0 | 0 |
| 20 | Mizoram | 22 | 0 | 0 | 0 | 0 | 0 | 0 |
| 21 | Nagaland | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| 22 | Odisha | 314 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | Punjab | 138 | 110 | 80 | 4 | 3 | 2 | 1 |
| 24 | Rajasthan | 243 | 172 | 71 | 24 | 10 | 20 | 8 |
| 25 | Sikkim | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| 26 | Tamil Nadu | 1129 | 374 | 33 | 48 | 4 | 235 | 21 |
| 27 | Tripura | 39 | 0 | 0 | 0 | 0 | 0 | 0 |
| 28 | Uttar Pradesh | 820 | 111 | 14 | 68 | 8 | 82 | 10 |
| 29 | Uttarakhand | 18 | 0 | 0 | 2 | 11 | 5 | 28 |
| 30 | West Bengal | 271 | 0 | 0 | 1 | 0 | 53 | 20 |
| | Total (States) | 6554 | 1069 | 16 | 217 | 3 | 693 | 11 |
| | Union Territories | | | | | | | |
| 1 | Andaman & Nicobar | 36 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2 | Chandigarh | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 3 | Dadra & Nagar Haveli | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4 | Daman & Diu | 2 | 1 | 50 | 0 | 0 | 1 | 50 |
| 5 | Lakshadweep | 9 | 0 | 0 | 0 | 0 | 3 | 33 |

| | | | | | | | | |
|---|-------------|------|------|----|-----|---|-----|----|
| 6 | Puducherry | 4 | 1 | 25 | 0 | 0 | 0 | 0 |
| | Total (UTs) | 53 | 2 | 4 | 0 | 0 | 4 | 8 |
| | GRAND TOTAL | 6607 | 1071 | 16 | 217 | 3 | 697 | 11 |

3.3 The Ministry of Water Resources, River Development & Ganga Rejuvenation, in their written communication, stated that the number of over-exploited units (dark blocks) was 802 in 2009, but it has increased to 1071 (33%) as per assessment year of 2011. The Ministry also submitted that indiscriminate withdrawal of ground water for irrigation, industries and domestic purposes had led to over-exploitation of ground water in 1071 units, i.e. about 16.21% of the total units. The location details of Over-exploited Assessment Units (Dark Blocks) of various States/UTs in India are given in Annexure-II.

3.4 When the Committee asked about areas and proportion (or percentages) of agricultural land in India covered under 'Dark Blocks' (over-exploited assessment units), the Ministry of Water Resources, River Development & Ganga Rejuvenation stated as under:

"The ground water assessment is carried out on assessment units basis and there are 1071 'Over-exploited' assessment units (Dark Blocks) covering total area of about 5 lakh sq.km. Information on land use / land cover, including agricultural land for 'Over-exploited' assessment units, is not readily available."

3.5 On being further asked to state whether any study has been undertaken by the Government in this regard, including the losses caused to agriculture, economy, health and environment, the Ministry submitted that no such study has been taken up by the Central Ground Water Board.

Ground Water Scenario in 9 critical States

3.6 According to the Ministry of Agriculture, the number of over-exploited units (dark blocks) are significantly higher (more than 15% of the total assessed units) in Delhi, Haryana, Himachal

Pradesh, Karnataka, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and UTs of Daman & Diu and Puducherry. The Ministry of Water Resources, River Development & Ganga Rejuvenation, also stated that the ground water scenario has reached a critical stage in 9 States, i.e. Punjab, Rajasthan, Haryana, Delhi, Karnataka, Tamil Nadu, Uttar Pradesh, Andhra Pradesh and Telangana. The details regarding ground water scenario in the 9 critical States, as received from the Ministry of Water Resources, River Development & Ganga Rejuvenation, are given in the Table below:

Table-2: Ground Water Scenario in 9 critical States (as on 2011)

| Sl. No. | Name of States | Stage of Ground Water Development (%) | No. of over-exploited assessment units (Dark Blocks) | No. of blocks notified by CGWA |
|---------|----------------|---------------------------------------|--|--------------------------------|
| 1. | Punjab | 172 | 110 | 45 |
| 2. | Rajasthan | 137 | 172 | 35 |
| 3. | Haryana | 133 | 71 | 17 |
| 4. | Delhi | 137 | 18 | 3 |
| 5. | Karnataka | 64 | 63 | 22 |
| 6. | Tamil Nadu | 77 | 374 | 18 |
| 7. | Uttar Pradesh | 74 | 111 | 1 |
| 8. | Andhra Pradesh | 37 | 41 | 7 |
| 9. | Telangana | 54.8 | 42 | |

Factors responsible for Dark Blocks

3.7 The Committee desired to know the factors that have led to increase in the number of 'Over-exploited' (Dark Blocks), 'Critical' and 'Semi-critical' assessment units in 2011 as compared

to 2009. To this, the Ministry of Water Resources, River Development & Ganga Rejuvenation replied as under:

"Increase in draft vis-à-vis reduction in rainfall recharge is one of the major reasons for increase in the number of 'Over-exploited' (Dark Blocks), 'Critical' and 'Semi-critical' assessment units in 2011 as compared to 2009. Besides this, increase in total number of assessment units in 2011 from 2009 by 765, due to the change in assessment unit in Tamil Nadu from Block to Firka (which is a smaller administrative unit than Block) also attributes to the increase in number of over-exploited / critical and semi-critical assessment units during 2011."

3.8 The Ministry of Agriculture, in their Background Note informed the Committee that the reason for over-exploitation in the North-western part, i.e. Punjab and Haryana, is indiscriminate extraction of ground water, mainly for irrigation purpose. In the Western part of the country, viz. Rajasthan and Gujarat, over-exploitation is caused by arid climate resulting in scanty and irregular rainfall and consequent less recharge. In the Southern part of the country, i.e. Karnataka and Tamil Nadu, large number of Over-exploited blocks are caused because of hard rock terrain, which permit less recharge and thus result in water stressed condition.

Implications of Dark Blocks on India's Ground Water scenario

3.9 According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, the Dark (over-exploited) Blocks hold implications on the ground water scenario of the country, which include significant decline in ground water levels, critical (water) position / situation in the Northern States, drying up of wells, deterioration in ground water quality, increasing energy consumption for lifting water, and need to regulate extraction, development and management of ground water.

Deteriorating ground water scenario in Northern India

3.10 The representative of the Ministry of Water Resources, River Development & Ganga Rejuvenation submitted during oral evidence held on 27.01.2015 that the situation regarding ground water scenario is “aggravating in Punjab, Haryana and Rajasthan because of the unsuitable cropping pattern, i.e. the paddy that is grown in Punjab and Haryana uses huge amount of water”.

3.11 On being asked whether the Ministry has any specific suggestion to ameliorate the distressing ground water scenario in Punjab, Haryana and Rajasthan due to over-exploitation of ground water, the Committee were apprised as under:

“Suggestions to improve the distressing ground water scenario include:

- On-Farm Water Management techniques such as Laser Levelling, Zero Tillage, use of Tensiometer in Paddy cultivation, adoption of improved irrigation methods, adoption of micro irrigation (sprinkler & drip), mulching for reduction of evaporation losses, timely transplanting of paddy, conjunctive use of canal and ground water, etc. should be effectively adopted.
- A conceptual document entitled ‘Master Plan for Artificial Recharge to Ground Water’ has been circulated to all States/ UTs, including Punjab, Haryana and Rajasthan for its implementation. The State Governments may use this Plan for its effective implementation to arrest declining ground water resources.
- The canal irrigation system, which was planned in view of the then cropping pattern, cropping intensity and ground water quality and quantity situations needs revision.
- Further, the use of flat rates for electricity or free electricity, combined with unreliable supplies, adversely affects the use of ground water. So, there is need to revamp agricultural power supply and pricing structure.
- As per the information received from the State Government, the Punjab Preservation of Sub-Soil Water Ordinance, 2008 in State of Punjab provides for the prohibition of

sowing nursery of paddy before 10th May and transplanting paddy before 15th June. The contravention of the provisions of the Ordinance invites penalty of Rs.10000/- per hectare per month or part thereof.

- The Haryana State Preservation of Sub Soil Water Act, 2009 has been enacted in the State of Haryana which prohibits sowing and transplanting of paddy before 15th of May and 15th of June, respectively. The Act was notified on 18th March, 2009.
- In the State of Rajasthan, most of the rice production/ paddy cultivation is limited to canal command area of IGNP (Ganganagar & Hanumangarh districts) and reasonably good rainfall areas of southern Rajasthan (parts of Kota, Bundi, Baran, Jhalawar, Dungarpur districts) where mainly rain-fed paddy is grown with occasional supplementary irrigation from ground water."

3.12 When the Committee asked whether any study has been conducted by the Government regarding the problem of excessive withdrawal of ground water due to paddy cultivation in these three States, the Ministry replied as under:

"Central Ground Water Board (CGWB) carries out periodic assessment of replenishable ground water resources every 2 years jointly with the respective State Ground Water Departments, including Punjab, Haryana and Rajasthan. The study is focused on ground water draft/withdrawal for all the sectors like irrigation, drinking/domestic and industry against the net ground water availability, which is based on the recharge through rainfall, applied irrigation (ground water/surface water), water conservation structures and lakes and ponds. As per the latest assessment (year-2011), ground water withdrawal for irrigation purpose accounts for 97.96% in the Punjab, 94.58% in Haryana and 88.47% in Rajasthan. However, no specific study has been conducted by CGWB regarding the problem of excessive withdrawal of ground water due to paddy cultivation in the States of Punjab, Haryana and Rajasthan."

Measures taken by the Government for Dark Blocks

3.13 The Committee asked during oral evidence held on 27.01.2015 regarding action taken by the Government to address the ground water scenario in the country. To this query, the representative of the Ministry of Water Resources, River Development & Ganga Rejuvenation replied as under:

"Sir, every two years we calculate the resource estimations, which is dynamic resource estimations. Last we have measured it on the base year of 2011. So, based on that, we gave suggestions. We have also, at our level, prepared a conceptual artificial recharge master plan, and that has been circulated to all the State Departments. We have requested them for the implementation of that artificial recharge scheme. Simultaneously, where there is an overexploited block, which was called earlier 'dark block', we have taken regulatory measures. We are insisting the State Departments to adopt the regulations, also to have their own Act and to regulate the groundwater. We have also circulated the Model Bill to them.

So, these are the major steps which we have taken. Simultaneously we are doing our own works regularly. As per our mandate, we are carrying out the groundwater exploration. We have guidelines to the norms and the groundwater resource assessment. We have water well drilling techniques. We have also given how to do it in the arsenic area. We have given a technique how to delineate the arsenic, I mean, arsenic-free aquifers. We have given the technology."

3.14 The measures taken up so far by the Government to address the ground water scenario, including 'Dark Blocks' in the country, are enumerated under the following paras:

(a) Directions by Central Ground Water Authority

3.15 The Central Ground Water Authority (CGWA) has been constituted under the Environment (Protection) Act, 1986 for the purpose of regulation of ground water development and management in the country. The CGWA is headed by the Chairman, CGWB, and has 14

other Members from different Ministries / Departments / Organisations / Institutions of Government of India. The Ministry of Water Resources, River Development & Ganga Rejuvenation informed that the CGWA has notified 162 areas (Districts, Blocks, Mandals, Talukas, Municipal areas, etc.) in the country for regulation of ground water development and management. In these notified areas, installation of new ground water abstraction structures is not permitted without prior specific approval of the Authorised Officers. The areas notified by CGWA, including the total number of Blocks/Mandals/Talukas/Areas involved, are given in the Table below:

Table - 3: Total number of Blocks/Mandals/Talukas/Areas notified by CGWA.

| Sl. No. | Name of the States/UTs | No. of Blocks/Mandals/Talukas/Areas |
|---------|------------------------|-------------------------------------|
| 1. | Andhra Pradesh | 5 |
| 2. | Telangana | 2 |
| 3. | Diu | 1 |
| 4. | Gujarat | 4 |
| 5. | Haryana | 17 |
| 6. | Karnataka | 22 |
| 7. | Madhya Pradesh | 7 |
| 8. | NCT of Delhi | 3 |
| 9. | Puducherry | 1 |
| 10. | Punjab | 45 |
| 11. | Rajasthan | 35 |
| 12. | Tamil Nadu | 18 |

| | | |
|-----|---------------|------------|
| 13. | Uttar Pradesh | 1 |
| 14. | West Bengal | 1 |
| | Total | 162 |

(i) Issuance of other Directions

- Directions have been issued vide Public Notice dated 08.10.2009, appeared in January 2010, to all the Residential Group Housing Societies/ Institutions/ Schools/ Hotels/ Industrial Establishments falling in the over-exploited and critical areas (except in the water-logged areas) in the country to adopt Roof Top Rain Water Harvesting systems in their premises.
- Directions have been issued vide letter dated 08.10.2009 for Implementation of Ground Water Recharge measures along all National Highways, State Highways and other major roads by CRRI, National Highways Authority of India, CPWD, State PWDs; along rail tracks by Indian Railways; in the Stadia by Sports Authority of India, BCCI, Departments of Sports and Youth Affairs; and in the Airports by Airport Authority of India, Ministry of Civil Aviation for Promoting Rain Water Harvesting/ adoption of Artificial Recharge to Ground Water in the country (except in the water-logged areas).
- CGWA has issued directions vide letter dated 08.08.2006 to Chief Secretaries in 12 States and Administrators in Union Territories having over-exploited blocks to take necessary measures to promote/adopt artificial recharge to ground water/rain water harvesting.
- CGWA has directed vide Public Notice dated 25.09.2010 that large and medium Industries using ground water in the over-exploited and critical areas in the country (except in the water-logged areas) to take up water conservation measures, including recharge of ground water / rain water harvesting and adopt practices for treatment, recycle and reuse of waste water in their premises.
- Directions have been issued vide letter dated 06.09.2011 to Chief Secretaries/ Administrators of all the States/ Union Territories and Ministry of Urban Development to take necessary action to adopt rain water harvesting/ artificial recharge on all the Government buildings.

(ii) Enforcement power of CGWA

3.16 It is stated that the CGWA has been vested with powers of penal provisions contained in Section 15 to 21 of the Environment (Protection) Act, 1986 to enforce its regulatory directions. For enforcement of the regulatory directions issued under section 5 of the Environment (Protection) Act, 1986, Deputy Commissioners/District Collectors concerned have been authorized to take necessary action in case of violation of directions of CGWA in the notified areas. It has sent letters to Chief Secretaries to ensure compliance to the directions issued by it and also has advised Regional Directors to pursue this matter with the State Governments. The Ministry of Water Resources, River Development & Ganga Rejuvenation informed that altogether 133 complaints have been received from the notified areas.

3.17 Further, for effective regulation of ground water development and management, Advisory Committees under the Chairmanship of District Collector / Deputy Commissioner with members drawn from various organizations have been constituted.

3.18 On being asked by the Committee as to what penal action has been taken against any person/authority till date in this regard, the Ministry replied as under:

“Illegal wells have been sealed. Action is being taken by the authorized officers under the provisions of the Environment (Protection) Act, 1986.”

(iii) No Objection Certificates in non-Notified areas

3.19 When the Committee asked about the necessary action taken for ground water regulation in non-Notified areas, the Ministry stated that in non-Notified area, the Central Ground Water Authority accords 'No Objection Certificate' (NOC) for withdrawal of ground water to new and expansion of industrial / infrastructure mining projects based on guidelines / criteria fixed for

evaluation of such projects. NOC for industries is accorded with the condition to adopt artificial recharge measures, mandatory recycling and re-use of water depending upon the stage of ground water development of the area. The details regarding criteria / guidelines for issuance of NOC laid down by CGWA are given in the table below:

Table 4 : Details of criteria / guidelines for issuance of NOC laid down by CGWA

(i) The criteria / guidelines for issuance of NOC for industries / infrastructure / mining projects

| Category of Assessment Unit based on ground water development | Withdrawal permitted (% of proposed recharge) |
|---|--|
| Safe | No Objection Certificate (NOC) is required for ground water withdrawal, if the quantity of ground water abstraction exceeds 100m ³ /day. Artificial recharge to ground water to be adopted. |
| Semi-Critical | Withdrawal may be permitted subject to undertaking of recharge measures. The withdrawal should not exceed 200% of the recharged quantity. |
| Critical | Withdrawal may be permitted subject to undertaking of recharge measures. The withdrawal should not exceed 100% of the recharged quantity. |
| Over-exploited | Withdrawal may be permitted subject to undertaking of recharge measures. The withdrawal should not exceed 50% of the recharged quantity. |

(ii) The criteria / guidelines for issuance of NOC to mineral water / packaged drinking water / soft drink plants using ground water

| Category of Assessment Unit based on ground water development | Ground water withdrawal limit for packaged drinking / soft drink industries |
|---|---|
| Safe | Withdrawal limited to 200% of ground water recharge |
| Semi-Critical | Withdrawal limited to 100% of ground water recharge |

| | |
|----------------|--|
| | |
| Critical | Withdrawal limited to 50% of ground water recharge |
| Over-exploited | No permission for industries under this category |

3.20 On being further asked about the mechanism of monitoring the implementation of directions issued by CGWA, the Ministry stated as under:

“The NOC issued by CGWA have to be renewed after 2 years, then 3 years and thereafter 5 years, subject to the compliance of conditions mentioned in the NOC. At the time of renewal of NOC, compliance of conditions is checked by Authorised Officers of CGWA. They also take up inspection in case of complaints received against the firms which have been issued NOC by CGWA or against the NGT/Court orders.”

3.21 The Ministry also stated that the CGWA has informed all State Pollution Control Boards to set up monitoring mechanism to verify requirement and actual withdrawal of ground water, including implementation of artificial recharge measures by industries/projects. In addition, random inspections by the Central Ground Water Board (CGWB) are carried out to check that the industries/projects using ground water are complying with the conditions laid down in the NOC granted to such industries by CGWA. Upon the directions of NGT / courts, the authorised officers of CGWB are also inspecting industries/projects and reporting the implementation of conditions laid down under NOCs / guidelines. Regarding the frequency of inspection, no time-line for inspection are fixed at present but upon complaint of violations, such inspections are ordered / directed.

(b) Rain Water Harvesting & Artificial Recharge to Ground Water

3.22 Rain water harvesting is the technique of collection and storage of rain water on surface, or in subsurface in aquifers through artificial recharge, before it is lost as surface run off. Rain water harvesting and artificial recharge helps in augmenting ground water resources as well as in raising ground water levels. The surface storages methods for water conservation are generally suitable for areas where surface storage is more feasible than ground water recharge. The harvested rain water can be stored in storage tanks and ponds. The Ministry of Water Resources, River Development & Ganga Rejuvenation, in their written reply to a query, stated that areas where depth to ground water level is more than 8 metres below ground level (mbgl) and which experience declining trends of water level, are considered suitable for artificial recharge. Methods of water conservation through storage include collection of rain water and its recharge to the near surface shallow aquifer through suitable civil structures. The selection of techniques for rain water harvesting and recharge is based on topography, hydro geological set-up, rainfall pattern, depth to water level, etc. Recharge of surplus run off also indirectly helps in mitigating flash floods, soil erosion and silting of reservoirs and rivers, etc.

(i) Demonstrative projects for Rain Water Harvesting & Artificial Recharge to Ground Water

3.23 According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, rain water harvesting and artificial recharge to ground water are amongst the most effective measures to check decline in ground water levels. As a remedy to the situation, the Ministry is promoting rain water harvesting and artificial recharge measures in the country, by supplementing the efforts of State Governments through technical and financial support under various schemes.

3.24 The CGWB has undertaken Demonstrative Rain Water Harvesting and Artificial Recharge projects in priority areas such as 'Over-Exploited' (Dark Blocks) and 'Critical' assessment units during 11th Plan under the Scheme of 'Ground Water Management & Regulation'. The project aimed at facilitating State Governments for replicating recharge projects in similar hydro geological environment. During the 11th Plan, 133 demonstrative recharge projects costing Rs. 99.87crore were approved for construction of artificial recharge structures in 22 States. Out of these 133 Artificial Recharge Projects, 109 projects with an approved cost of Rs. 51.24 crore were taken up in the year 2011-12. The scheme closed on 31.03.2012.

3.25 The State-wise details of funds allocated and released in respect of the scheme of 'Ground Water Management & Regulation' are given in the Table below:

Table – 5 : State-wise details of funds allocated and incurred under 'Ground Water Management & Regulation' during 11th Plan.

| Sl. No. | Name of the States/UTs | Approved cost (Rs. in lakh) | Amount released as on 31.1.2015 (Rs. in lakh) | Number of structures approved | No of structures completed as on 31.1.2015 |
|---------|------------------------|-----------------------------|---|-------------------------------|--|
| 1 | Andhra Pradesh | 130.020 | 130.020 | 29 | 27 |
| 2 | Arunachal Pradesh | 493.11 | 493.11 | 80 | 80 |
| 3 | Bihar | 96.01 | 96.01 | 11 | 9 |
| 4 | Chhattisgarh | 268.80 | 258.85 | 34 | 19 |
| 5 | Chandigarh | 776.03 | 774.52 | 54 | 52 |
| 6 | Delhi | 43.44 | 43.44 | 10 | 10 |
| 7 | Gujarat | 316.24 | 266.23 | 116 | 100 |
| 8 | Himachal Pradesh | 250.017 | 248.48 | 20 | 4 |
| 9 | Jammu & Kashmir | 143.47 | 119.10 | 5 | 2 |

| | | | | | |
|----|----------------|----------|---------|------|------|
| 10 | Jharkhand | 191.35 | 205.96* | 69 | 69 |
| 11 | Karnataka | 588.093 | 588.09 | 192 | 192 |
| 12 | Kerala | 94.14 | 81.65 | 91 | 63 |
| 13 | Madhya Pradesh | 860.91 | 672.13 | 51 | 34 |
| 14 | Maharashtra | 15.15 | 15.15 | 49 | 49 |
| 15 | Nagaland | 224.14 | 224.14 | 64 | 64 |
| 16 | Odisha | 464.36 | 325.04 | 66 | 43 |
| 17 | Punjab | 260.33 | 110.46 | 86 | 15 |
| 18 | Rajasthan | 404.777 | 284.14 | 52 | 22 |
| 19 | Tamil Nadu | 526.35 | 526.35 | 273 | 273 |
| 20 | Telangana | 443.39 | 443.39 | 90 | 88 |
| 21 | Uttar Pradesh | 3286.23 | 2954.11 | 189 | 145 |
| 22 | West Bengal | 111.09 | 111.09 | 30 | 29 |
| | Total | 9987.447 | 8971.46 | 1661 | 1389 |

* It is also to mention that an additional amount Rs.14.61 lakh has been sanctioned & released as payment of the service tax @ 4.2 %, Contract Workers Cess @ 1% and Work Contingencies @ 3% in respect of Scheme of Artificial Recharge & Rain Water Harvesting Structures within the compounds of Indian School of Mines, Dhanbad, Jharkhand State.

3.26 When the Committee enquired whether the Ministry had made any separate allocations of funds for recharge of 'Dark Blocks' and regarding contamination of ground water, the Ministry replied as under:

"During 12th Plan, CGWB has taken up Aquifer Mapping and Management Program, wherein, aquifer-wise ground water resources and quality is to be assessed in priority areas covering 8.89 lakh sq.km. Priority areas include water stressed ('Over-Exploited' areas) and quality vulnerable areas. The aquifer mapping program also envisages

preparation of aquifer-wise management plans, which includes component of artificial recharge to ground water and mitigation of ground water quality issues. The management plans will be shared with the State Governments concerned for implementation. During 12th Plan, Rs. 2051 crore have been allocated for the Aquifer Mapping and Management plan. There is no separate scheme for artificial recharge to ground water or contamination of ground water during 12th Plan.”

3.27 The Ministry of Water Resources, River Development & Ganga Rejuvenation stated that demonstrative projects for Rain Water Harvesting and Artificial Recharge to Ground Water taken up during the 8th, 9th and 10th Plan period resulted in the annual ground water recharge of 4.0 Million Cubic Meter (MCM), 45.0 MCM and 2.14 MCM, respectively. The anticipated recharge from Demonstrative Artificial Recharge projects implemented during the 11th Plan is likely to be 55.20 MCM. Priority for Demonstrative Projects was given to the areas falling in over-exploited / dark blocks.

(ii) Master Plan for Artificial Recharge to Ground Water in India

3.28 The Ministry stated that based on the experiences gained, the Central Ground Water Board has prepared a conceptual document titled ‘Master Plan for Artificial Recharge to Ground Water in India’ during 2013.

3.29 The said Master Plan envisaged construction of different types of Artificial Recharge and Rain Water Harvesting structures in the country in an area of 9,41,541 sq. km. by harnessing surplus Monsoon runoff to augment ground (water) resources. It was also circulated to all the State Governments. The Master Plan incorporates (i) identification of suitable areas for artificial recharge, (ii) estimation of sub-surface storage space availability, (iii) quantification of local surplus annual run off availability as source water for artificial recharge, and (iv) recommending number and types of structures required along with their estimated costs. It also provides district-

wise number of feasible artificial recharge structures along with their estimated costs. Total area identified for artificial recharge in the country is nearly 9.4 lakh sq.km. Total estimated volume of water to be recharged is 85.6 bcm.

3.30 Asked to state the response of State Governments to the 'Master Plan for Artificial Recharge to Ground Water in India', the Ministry furnished the following reply:

"The response from 06 State/UT Governments received is given below. Response from remaining State/UT Governments is still awaited."

Table – 6 : Follow-up action by State / UT Governments on Master Plan for Artificial Recharge to Ground Water.

| Sl. No. | Name of the States | Status |
|---------|--------------------|---|
| 1. | Gujarat | The Master Plan of Artificial Recharge to the Ground Water -2013 was distributed to Gujarat Water Resources Development Corporation (Government of Gujarat). A Project task force was prepared by GWRDC for Managed Aquifer Recharge and it was submitted (by) Government of Gujarat which is under consideration. The task force comprising of technical experts was constituted by Government of Gujarat to prepare First Approximation Report for ground water recharge in 6 major river basins and the task force recommended construction of 15678 percolation tanks, 22607 check dams, 14712 recharge tube wells and 42000 modifications to dug wells costing Rs 2756 crore to recharge 1643 MCM water. The implementation of the report is under active consideration. |
| 2. | Madhya Pradesh | The Chief Engineer (Bodhi) constituted a co-ordination committee for finalizing Master Plan of Artificial Recharge to Ground Water of M.P. The divisional Ground Water survey units of Water Resources Department were directed to submit proposal based on the Master Plan. The Superintending Engineer, Ground Water Survey, Water Resources Department, Government of Madhya Pradesh has informed that a proposal for artificial recharge to ground water in and around Bazada Zone of |

| | | |
|----|---------------------------|---|
| | | Burhanpur district has been prepared in consultation with CGWB, Bhopal and submitted to Chief Engineer for its approval. Some more proposals are also awaited from field offices. These proposals will be discussed with CGWB officers before finalizing them. |
| 3. | Rajasthan | Watershed Development & Soil Conservation Department, Government of Rajasthan, asked the specific locations of structures with longitudes & latitudes of the proposed artificial structures for the implementation of Master Plan of Artificial Recharge to Ground Water. |
| 4. | Uttar Pradesh | Government of Uttar Pradesh while framing 'Comprehensive Policy for Ground Water Conservation, Rain Water Harvesting & Ground Water Recharge,' under para 7.3 (b) mentioned the policy highlights of the Master Plan of CGWB, which has been issued <u>vide</u> Gazette notification of Govt. of Uttar Pradesh on 18 Feb 2013 under letter no. 280/62-1-2013-7 WP-2004 TC – III. All districts of Uttar Pradesh have been asked to adhere with the above notification while making Artificial Recharge & ground water developmental plan. |
| 5. | West Bengal | Certain artificial recharge structures are being constructed by PHED, Government of West Bengal utilizing the guidelines provided in Master Plan. |
| 6. | Andaman & Nicobar Islands | Recommendation of CGWB as per Master Plan is being considered for implementation in Andaman & Nicobar Islands as stated by APWD. |

3.31 The Ministry also stated that Kerala and West Bengal have constructed 30 and 255 recharge structures at an expenditure of Rs. 29.89 lakh and Rs. 3,305 lakh, respectively, since the circulation of the Master Plan. The Ministry further stated that no review has been done regarding implementation of the Master Plan, but the CGWB is regularly pursuing the State Departments to take up the artificial recharge by adopting the Master Plan.

3.32 According to the Ministry, the CGWA has issued directions on 08.08.2006 to Chief Secretaries of 12 States and Administrators of Union Territories having 'Over-exploited' (Dark Blocks) to take necessary measures to promote / adopt artificial recharge to ground water / rain

water harvesting. When asked about the response of these States / UTs regarding mandatory roof top rainwater harvesting / artificial recharge to ground water, the Ministry replied that in all the 12 States and 2 UTs, roof-top rain water harvesting has been made mandatory by inclusion in their building by-laws or through Government Orders.

3.33 When the Committee asked whether some specific initiatives were being proposed so that all the States/UTs opt for mandatory rainwater harvesting / artificial recharge to ground water, the Ministry replied as under:

“Roof-top rain water harvesting has been made mandatory in 31 States/UTs. Remaining States are mostly hilly and rain water harvesting in these States is already in practice. Further, the matter will be pursued with them to make it mandatory.”

(c) Model Bill on Ground Water Development and Management

3.34 The Ministry of Water Resources, River Development & Ganga Rejuvenation informed the Committee that with a view to protecting the ground water regime and taking safeguard measures against hazards of over-exploitation and to ensure equitable distribution of this vital and limited resources, the Central Government had circulated a Model Bill to regulate and control the development of ground water to all States/UTs in 1970 to enact suitable legislation. The Model Bill was re-circulated in 1992 and again in 1996 for adoption. The Ministry, in their written reply, stated that the Planning Commission had desired that the focus of the Model bill should be shifted from mere regulation to ground water development and management. Accordingly, a revised Model Bill, 2005 to ‘Regulate and Control the Development and Management of Ground Water’ had been circulated again on 28.02.2005.

3.35 In the revised Model Bill circulated in 2005, a new chapter on Rain Water Harvesting for Recharge to ground water has been introduced, which provides for:

- (a) Identification of recharge worthy areas, issuance of necessary guidelines for adoption of rain water harvesting for ground water recharge in these areas and issuance of direction by the Authority to the Department concerned to include rainwater harvesting in all development schemes falling under notified areas.
- (b) Imposition of stipulated conditions by the Municipal Corporation or any other local Authority for providing roof top rain water harvesting structures in the building plan in an area of 100 sq. m or more, while according approval for construction.
- (c) Promotion of rainwater harvesting and artificial recharge by the Authority through Mass Awareness and Training Programmes.

3.36 The Model Bill stipulates (a) establishing of State Ground Water Authorities to frame policies for administration of the legislation, (b) empowering the State / Union Territory Groundwater Authorities to control and / or regulate the abstraction of ground water, and (c) requiring users of ground water to seek permission from the State Ground Water Authority to sink a well in the notified area. The objective of the legislation is to regulate and control the development of ground water. With a view to bringing equity in the distribution of the resources, the 'Small' and 'Marginal' farmers have been exempted. The status of enactment of legislation on the Model Bill in various States/UTs is given in the Table below:

Table – 7: Status of enactment of legislation on Model Bill on Ground Water Development and Management

| A. States/UTs where legislation for regulation of ground water development has been enacted | | | |
|---|----------------------|-----|-----------------|
| 1. | Andhra Pradesh | 8. | Jammu & Kashmir |
| 2. | Assam | 9. | Karnataka |
| 3. | Bihar | 10. | Kerala |
| 4. | Chandigarh | 11. | Lakshadweep |
| 5. | Dadra & Nagar Haveli | 12. | Maharashtra |
| 6. | Goa | 13. | Puducherry |

| | | | |
|----|--|-----|---------------|
| 7. | Himachal Pradesh | 14. | West Bengal |
| | | 15. | Telangana |
| B. | States/UTs where initiatives taken for enactment of Model Bill | | |
| 1. | Andaman & Nicobar | 9. | Meghalaya |
| 2. | Chhattisgarh | 10. | Mizoram |
| 3. | Daman & Diu | 11. | Odisha |
| 4. | NCT Delhi [#] | 12. | Rajasthan |
| 5. | Gujarat | 13. | Uttarakhand |
| 6. | Haryana | 14. | Uttar Pradesh |
| 7. | Jharkhand | 15. | Punjab |
| 8. | Madhya Pradesh | | |
| C. | States which do not feel the need for enactment of legislation | | |
| 1. | Arunachal Pradesh | | |
| 2. | Manipur | | |
| 3. | Nagaland | | |
| 4. | Sikkim | | |
| 5. | Tripura | | |

[#] Government of NCT of Delhi is regulating ground water withdrawal through notifications.

(i) Supreme Court's direction on Model Bill

3.37 The Ministry informed that the first review of effectiveness or adequacy of legislations/acts/laws on ground water issues was done by the Hon'ble Supreme Court of India between 1985 and 1996 in the light of Writ Petition (Civil) No. 4677 of 1985 filed by Shri M.C. Mehta vs Union of India & Others. The Hon'ble Supreme Court reviewed the Model Bill circulated by the Central Government to the States / Union Territories in the year 1970, the legal framework in place, State enactments in this connection, the Constitutional provisions on allocation of business among Centre and States/UTs, etc., and the need for strengthening the

institutional framework. The Hon'ble Supreme Court also directed the National Environmental Engineering Research Institute (NEERI) in 1996 to have the matter examined at the institutional level to file a report. NEERI was also requested to give suggestions/recommendations. The recommendations of NEERI include, among others, (i) regulation on exploitation through legislation and effective administration with focus on water conservation, recycle-reuse, restrictions to ensure equitability in water availability and pragmatic land use, and (ii) regulation by education, i.e. by creating awareness amongst the people to enable their participation and traditional knowledge in sustainable water resource management. The Ministry also re-circulated the Model Bill from time to time, to States/UTs and ensured enactment of legislations related to ground water regulation and management. So far, 15 States/UTs have enacted the legislation. The present review and enactments are within the existing framework of constitutional provisions.

3.38 As regards regulations on wastage of water in the country, the Water and Power Consultancy Services (WAPCOS) Ltd., in response to a pertinent query by the Committee, have stated in a written reply that in India the law making for utilization of water resources started in 1873. Even today, there exists no competent statutory authority for formulating the water policy. More than 90% of the laws enacted for the utilization of water resources are State-level legislations only. At the time of enactment of these laws, the environmental factor was not at all a serious concern and utilization of water had been a priority area rather than the conservation of water. A list of State regulations made by a few States like Kerala, Karnataka, Tamil Nadu, UP, Delhi, Odisha, Andhra Pradesh and Arunachal Pradesh for prohibition of wastage of water in the past was also, however, submitted before the Committee.

3.39 On being further enquired by the Committee whether any other country has any regulation on supply of water and use of water, the Ministry of Water Resources, River Development & Ganga Rejuvenation have in a written reply submitted as under:

"Yes, the Ground Water Regulation implemented by various other Countries are given below:

Ground Water Rule, United States Environmental Protection Agency, 2006 - The purpose of the rule is to reduce disease incidence associated with disease-causing microorganisms in drinking water. The rule establishes a risk-based approach to target ground water systems that are vulnerable to fecal contamination. Ground water systems that are identified as being at risk of fecal contamination must take corrective action to reduce potential illness from exposure to microbial pathogens. The rule will apply to all systems that use ground water as a source of drinking water. The GWR was signed on October 11, 2006. It was published in the Federal Register on November 08, 2006.

California Water Code, Groundwater Management, USA - On September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package, composed of AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley), collectively known as the Sustainable Groundwater Management Act. Some of these expanded responsibilities include: (1) developing regulations to revise groundwater basin boundaries; (2) adopting regulations for evaluating and implementing Groundwater Sustainability Plans (GSPs) and coordination agreements; (3) identifying basins subject to critical conditions of overdraft; (4) identifying water available for groundwater replenishment; and (5) publishing best management practices for the sustainable management of groundwater.

Oregon Groundwater Quality Protection Act of 1989, USA - The goal of the Oregon Groundwater Quality Protection Act is to prevent contamination of groundwater and to conserve, restore, and maintain Oregon's groundwater resource for present and future uses.

British Columbia, Canada In 2001, the legislature approved amendments to the Water Act as part of a broader initiative to improve drinking water protection in British Columbia. These amendments added a new "Part 5" to the Act entitled "Wells and Ground Water Protection". The new provisions took effect on November 1, 2004.

Water Resources Act 1991, UK - Sets out the responsibilities of the Environment Agency of England and Wales in relation to water pollution, resource management, flood defence, fisheries, and in some areas, navigation. The Act regulates discharges to controlled waters, namely rivers, estuaries, coastal waters, lakes and groundwater.

Water Act 2003, UK - Aims to improve water conservation, protect public health and the environment, and improve the service offered to consumers. The Act is in three parts relating to water resources, regulation of the water industry and other provisions. This

includes significant changes to water abstraction authorization, with water company drought plans and water resource management plans becoming statutory requirements.

European Communities Environmental Objectives (Groundwater) Regulations, 2010, Ireland - measures to prevent or limit the input of pollutants into groundwater and to prevent the deterioration of the status of all bodies of groundwater, protect, enhance and restore all bodies of groundwater and to ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status, the reversal of any significant and sustained upward trend in the concentration of any pollutant resulting from the impact of human activity in order to progressively reduce pollution of groundwater, determining: groundwater quantitative status, criteria and procedures for assessing groundwater chemical status."

(ii) Satellite Application Centres for better Ground Water Management

3.40 According to the Ministry of Rural Development, an exercise has begun for using satellite technology to identify the areas that are amenable for ground water recharging. Under it, Satellite Application Centers (SACs) are being strengthened in 8 States so that they will be able to assist the MGNREGA functionaries in better planning of water conservation structures. When asked about the details of the Satellite Application Centres (SACs) being strengthened in 8 States for using satellite technology to identify the areas amenable for ground water recharging, the Ministry of Rural Development, in a written reply, stated as under:

"Application of space technologies were identified and this initiative shall be piloted in 8 States, viz. Maharashtra, Karnataka, Kerala, Chhattisgarh, Andhra Pradesh, Haryana, West Bengal and Assam taking one district in each State initially. To start as pilot, Indore district of Madhya Pradesh has been selected, as it was having maximum census mapping. Census code was used to map our GPs with the GPs of GIS. The State Governments have to submit proposals for funding the project which is awaited. Once the pilot project takes off, the same will be worked out in other States, subject to preparedness of the State Governments."

(iii) Rain Water Harvesting structures in five star hotels

3.41 The Minister of State for Water Resources, River Development & Ganga Rejuvenation, in a written reply to unstarred question, informed the Rajya Sabha on 05 March, 2015 that the Government is aware that there were wastages of water from five star hotels in Delhi.

3.42 On being enquired by the Committee about further details of action taken by the Government to prevent misuse of water, the Ministry stated that as per the information received from the Government of NCT of Delhi, the following steps have been taken in this regard, as reproduced under:

- (i) "Signing of a MoU with 33 hotels in Delhi to complete the task of installation of Rain Water Harvesting System; installation of STP, Solar Water Heating System, Organic Waste Converter and Reuse of treated effluent leading to Zero discharge.
- (ii) The hotels have also been asked to obtain permission from Delhi Jal Board (DJB) for ground water extraction.
- (iii) Constitution of committee consisting of the officials from Department of Environment, Delhi Pollution Control Committee (DPCC), academicians of IIT and Jamia Millia Islamia University to review the progress of compliance by these hotels from time to time relating to Green Hotels guidelines. The said committee is reviewing the progress of compliance by these hotels.
- (iv) All these 33 hotels have installed Rain Water Harvesting structures and have installed STPs to treat and reuse the waste water."

(iv) Rain Water Harvesting structures in hospitals

3.43 When asked whether the National Green Tribunal (NGT) has issued warrants against the medical superintendents and directors of large hospitals for not installing rain water harvesting system and the remedial action taken by the Government in this regard, the Minister of State for

Water Resources, River Development & Ganga Rejuvenation, in a written reply to unstarred question, informed the Lok Sabha on 12 March, 2015 as under:

“Yes, Madam. Hon’ble National Green Tribunal (NGT) has issued bailable warrants against 12 hospitals in Delhi for not installing rain water harvesting system in their hospital premises, but upon application by the concerned hospitals, the warrants have been recalled.

Central Ground Water Authority (CGWA), constituted under Section 3 (3) of the Environment (Protection) Act, 1986 has issued directions for adopting rain water harvesting and artificial recharge to ground water in Residential Group Housing Societies / Institutions / Schools / Hotels / Industrial Establishments, etc. falling in ‘Over-Exploited’ and ‘Critical’ areas.”

(d) Monitoring of Ground Water

3.44 As per information given by the Minister of State for Water Resources, River Development & Ganga Rejuvenation, in reply to an unstarred question in Lok Sabha on 26 February, 2015, the Central Ground Water Board (CGWB) under the Ministry of Water Resources, River Development & Ganga Rejuvenation carries out ground water monitoring four times a year on regional scale through a network of observation wells in the country. The State/UT-wise number of ground water observation wells for the last three years are given in the Table below:

Table – 8: State/UT-wise status of ground water observation wells

| Sl. No. | Name of the States/UTs | Number of Ground Water Observation Wells (As on March, 2012 & 2013) | Number of Ground Water Observation Wells (As on March, 2014) |
|---------|------------------------|---|--|
| | States | | |
| 1. | Andhra Pradesh | 982 | 879 |
| 2. | Arunachal Pradesh | 12 | 30 |

| | | | |
|-----|----------------------|------|------|
| 3. | Assam | 302 | 460 |
| 4. | Bihar | 341 | 544 |
| 5. | Chhattisgarh | 709 | 1007 |
| 6. | Delhi | 162 | 120 |
| 7. | Goa | 102 | 145 |
| 8. | Gujarat | 1013 | 1197 |
| 9. | Haryana | 464 | 866 |
| 10. | Himachal Pradesh | 89 | 106 |
| 11. | Jammu & Kashmir | 197 | 288 |
| 12. | Jharkhand | 227 | 344 |
| 13. | Karnataka | 1507 | 1273 |
| 14. | Kerala | 925 | 1218 |
| 15. | Madhya Pradesh | 1246 | 1420 |
| 16. | Maharashtra | 1302 | 1651 |
| 17. | Manipur | 23 | 23 |
| 18. | Meghalaya | 36 | 64 |
| 19. | Nagaland | 19 | 31 |
| 20. | Odisha | 1110 | 1530 |
| 21. | Punjab | 361 | 755 |
| 22. | Rajasthan | 1118 | 1111 |
| 23. | Tamil Nadu | 1155 | 1351 |
| 24. | Telangana | - | 699 |
| 25. | Tripura | 41 | 75 |
| 26. | Uttar Pradesh | 1065 | 1309 |
| 27. | Uttarakhand | 133 | 182 |
| 28. | West Bengal | 888 | 1556 |
| | UTs | | |
| 1. | Andaman & Nicobar | 64 | 93 |
| 2. | Chandigarh | 28 | 25 |
| 3. | Dadra & Nagar Haveli | 07 | 12 |

| | | | |
|----|-------------|-------|-------|
| 4. | Daman & Diu | 14 | 16 |
| 5. | Puducherry | 11 | 18 |
| | Total | 15653 | 20698 |

Note: Ground water level data has been collected from all the States except for Mizoram, Sikkim and UT of Lakshdweep where water level monitoring is not being carried out.

3.45 The Minister of State for Water Resources, River Development & Ganga Rejuvenation inter alia also stated in reply that Ground water monitoring data of Central Ground Water Board (CGWB) for Pre-Monsoon 2014, compared with decadal mean of Pre-Monsoon (2004-2013), indicates that out of total wells analysed, around 39% wells were showing decline in ground water levels as observed in parts of Andhra Pradesh, Assam, Chhattisgarh, Daman & Diu, Delhi, Gujarat, Haryana, Karnataka, Kerala, Punjab, Rajasthan, Tamil Nadu and West Bengal. However, as per ground water level data, the situation cannot be termed as drought-like situation.

(i) MGNREGA and Ground Water Management & Development

3.46 As per information provided by the Ministry of Rural Development, most of the works under the Mahatma Gandhi National Rural Employment Guarantees Act (MGNREGA) 2005, are for water harvesting and recharging ground water such as (i) water conservation and water harvesting structures to augment and improve ground water like dykes, earthen dams, stop dams, check dams with special focus on recharging ground water, including drinking water sources, and (ii) renovation of traditional water bodies, including desilting of irrigation tanks and other water bodies. Expenditure on water conservation and water harvesting and renovation of traditional water bodies alone constitute 15.1% and 29.4% of the total expenditures on MGNREGA Scheme, i.e. Rs. 1,65,27,656.4 lakh.

3.47 When asked to give details of evaluation carried out regarding the progress of works done under the MGNREGA scheme, the Ministry of Rural Development submitted that a study conducted by the Indian Institute of Forest Management (IIFM), Bhopal for the State of Madhya Pradesh, with objectives to evaluate MGNREGA interventions from an ecological sustainability point of view and to provide suggestions for optimum utilization of assets created under MGNREGA, shows that the Kapildhara wells have been successful in providing irrigation facility and have increased the crop intensity in Dhar and Ratlam districts (MP). Also, a study conducted by the Indian Institute of Science, Bangalore, and GIZ across 5 States, viz. Rajasthan (Bhilwara), Madhya Pradesh (Dhar), Andhra Pradesh (Medak), Karnataka (Chitradurga) and Sikkim (South District) has concluded that the programme has had extensive, positive impact on the environment and in reducing the vulnerability to climate risks. The positive impacts established in the study include rise in water availability and area irrigated, improvement in soil quality, improvement in ground water levels, increase in area under irrigated crop production, and reduction in soil erosion and demonstrated impact on carbon sequestration.

(ii) Urban Local Bodies and Ground Water Management and Development

3.48 As per information provided by the Ministry of Urban Development, the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) had two components, viz. Urban Infrastructure & Governance (UIG) covering 65 big cities of the country and Urban Infrastructure Development Scheme for Small & Medium Towns (UIDSSMT) which covers all other 836 cities / towns which have elected Urban Local Bodies (ULBs) and not covered under UIG.

3.49 The Committee wanted to know the changes / improvements implemented or being proposed by the Government in JNNURM to give the programme more functional effectiveness

regarding ground water management/artificial recharge projects and renovation of water bodies, and apprise them of the details of cities (State/UT-wise) which have implemented these by-laws. To this query, the Ministry of Urban Development informed that JNNURM had ended on 31.03.2014. A new Urban Rejuvenation Mission (NURM) is under consideration of the Ministry, and the guidelines of the Mission are being finalized. They have also informed that State Governments are impressed upon from time to time through various channels, viz. review meetings, regular communication through letters, etc. for timely implementation of these by-laws. As per the Ministry of Urban Development, revision of building by-laws for mandatory Rainwater Harvesting in all buildings have been implemented / enacted in 60 cities across 29 States/UTs, viz. Andhra Pradesh (4), Arunachal Pradesh (1), Assam (1), Bihar (2), Chandigarh (1), Chhattisgarh (1), Goa (1), Gujarat (4), Haryana (1), Himachal Pradesh (1), Jammu & Kashmir (2), Jharkhand (1), Kerala (2), Karnataka (2), Madhya Pradesh (4), Maharashtra (5), Manipur (1), Meghalaya (1), Mizoram (1), Puducherry (1), Punjab (2), Odisha (2), Rajasthan (2), Tamil Nadu (3), Tripura (1), Uttarakhand (3), Uttar Pradesh (7), and West Bengal (2). They have also informed that by-laws on re-use of recycled water have been implemented/enacted in 61 cities across 30 States/UTs of the country.

3.50 Giving information about water bodies, the Ministry of Water Resources, River Development & Ganga Rejuvenation stated that the information on number of Water Bodies (i.e., tanks, reservoirs, ponds, etc.) which are used for minor irrigation is available from the Census. As per the information collected in the 4th Minor Irrigation census with reference year 2006-07, the total number of water bodies used for minor irrigation in the country was 523816. Out of these, the number of water bodies in-use and not-in-use are 443688 and 80128, respectively. The data on the number of ponds is not available separately.

3.51 When the Committee asked about the feasibility of inventorization of water bodies and whether any study is being done by the Government in this regard, the Ministry of Water Resources, River Development & Ganga Rejuvenation, in their written reply, submitted as under:

“Yes, Inventorization of water bodies is feasible. In order to collect the detail of water bodies, the Ministry of Water Resources, River Development & Ganga Rejuvenation has planned to undertake census of water bodies, including its lat-long along with other details.

Under India Water Resources Information system (WRIS) Project which is jointly executed by Central Water Commission (CWC) and National Remote Sensing Centre (NRSC), a total of 798909 water bodies with a water spread area ranging from 0.0103-67536.19 ha has been digitised. The Geographic Information System (GIS) layer is available in public domain at India –WRIS portal (www.india-wris.nrsc.gov.in).”

(e) Awareness Programmes

3.52 The Ministry of Water Resources, River Development & Ganga Rejuvenation informed that keeping in view the vital role of water in all aspects of life and also in assuring the development of the economy, the Ministry of Water Resources, River Development & Ganga Rejuvenation has been observing ‘World Water Day’ on a national level. Till now, 3 events have been organized at New Delhi as follows:

- (a) India Water Week, 2012 held during 10-14 April, 2012;
- (b) 2nd India Water Week, 2013 held during 8-12 April, 2013; and
- (c) 3rd India Water Week, 2015 held during 13-17 January, 2015.

3.53 The funds incurred for ‘India Water Week’ worked out to Rs. 2,06,34,545 in 2012, Rs. 3,36,07,860 in 2013 and Rs. 3.0 crore (approx) in 2015. Further, during the year 2011, it was

subsequently decided that the national level celebrations (sic) be transformed to international level on the lines of the events taking place as in Singapore and Stockholm. Earlier, 'India Water Week' was organized only in Delhi, but now it is being organized at district level also.

3.54 When the Committee enquired about the outcome of 'India Water Week' organized till date, the Ministry of Water Resources, River Development & Ganga Rejuvenation submitted as under:

"Organisation of 'India Water Week' provides a forum for interaction with stakeholders, policy makers, professionals, managers, academicians, etc. from States and various countries, particularly neighbouring countries. It helps in having better understanding of the issues pertaining to water, identifying most rational approach to water development and management and projecting know-how available in the country."

3.55 Asked further about improvements being proposed on 'India Water Week' awareness programme to make it more people-oriented and meaningful, the Ministry replied as under:

"To make 'India Water Week' more people-centric and to gainfully utilize the important occasion of India Water Week in conveying the message about serious water related issues and urgent need for water conservation in all its forms, Water Conservation Programmes have been organized throughout the country during the India Water Week.

One-day workshop on 'Hamara Jal – Hamara Jeewan' was taken up during organisation of India Water Week – 2015 in various districts where Scientists, Engineers, PRIs, Water Communities, Public Health Engineering Department officers, Agriculture officers, BDOs, other stakeholders and NGOs deliberated on issues of water conservation, finding indigenous solutions for meeting the demands and suggested future road map to manage water for growth. Participation of school students was an integral part at the programme for sensitizing the next generation for water conservation.

It is proposed to select at least one 'Jal Gram' in each district for taking up water conservation and water security schemes through convergence of existing programmes

such as Integrated Watershed Management Programme (IWMP), Repair, Renovation & Restoration (RRR) of Water Bodies, National Rural Drinking Water Programme (NRDWP), National Rural Health Mission (NRHM) on aspects of water quality, Rural Water Supply, etc.”

3.56 Regarding the involvement of academicians, student community, rural and urban local bodies in the India Water Week programme, the Ministry also submitted as follows:

“Academicians, students and urban bodies are already involved in India Water Week. During the India Water Week – 2015, one-day workshop on ‘Hamara Jal – Hamara Jeewan’ was organized in various districts of the country, wherein water resources available in the districts, utilization level of the available resources, constraints being faced by utilizing the resources were deliberated upon. During the event, agriculture set-up, irrigation, drinking water supply, industrial water supply and quality management area have been covered. In the workshop, representatives from NGOs / WALMIS (Water and Land Management Institutes) / Panchayati Raj Institutions/Departments of Agricultural/Horticulture/Watershed Development/PRD /PHED working in the districts were included as members of the organizing committee; also school students, people from various fields related to water resources were invited for participation.”

3.57 Further giving the notable outcomes/recommendations that have emerged from India Water Week events of 2012, 2013 and 2015, the Ministry of Water Resources, River Development & Ganga Rejuvenation furnished the details, some of which include (i) need for adoption of water ethics in policies and practices for planning and management of water resources, (ii) need for scientific assessment of environmental and ecological needs of the river and creation of adequate storage needs to augment the flow during lean season, (iii) need for judicious deployment of all measures for utilization of ground water as well as surface water in order to ensure their sustainability, (iv) need to frame policy and to design monitoring network based on available tools and technology for ensuring effective and extensive monitoring of water

quality as also of waste water quality, (v) need to treat waste water as resource and need to develop business model involving local entrepreneurship for making sewage treatment process a profitable proposition rather than a welfare work, and (vi) stress on participation of stakeholders in water management, i.e. 'Jan Andolan'.

(f) Comprehensive National Policy on Ground Water

3.58 The Ministry of Water Resources, River Development & Ganga Rejuvenation, in their Background Note, stated that "in view of indiscriminate withdrawal of ground water for irrigation, industries and domestic purposes leading to over-exploitation of ground water in 1071 about 16.21% of total units, there is need of comprehensive policy to address the problems of water scarcity in Dark (Over-exploited) Blocks of the country".

3.59 The Committee enquired if any comprehensive policy has been institutionalized to cope with the issue of over-exploitation of ground water. To this query, the Ministry replied as follows:

"The National Water Policy (2012) considers ground water as part of overall water resources. Issues related to ground water management have been adequately addressed. It lays emphasis on mapping aquifers to assess the quantity and quality of ground water resources and its management through participatory approach involving local communities. Further, it also advocates that declining ground water level in over-exploited areas needs to be arrested by introducing improved technologies of water use incentivizing efficient water use along with rain water harvesting and artificial recharge and encouraging community based management of aquifers. The policy has been circulated to all the State/UT Governments for appropriate action."

3.60 When asked whether the Ministry is monitoring the State Water Policies being formulated by various States in accordance with the National Water Policy, 2012, the Minister of State for Water Resources, River Development & Ganga Rejuvenation, in a written reply to an unstarred question, informed Lok Sabha on 26 February, 2015, as under:

“Yes, Madam. Ministry of Water Resources, River Development and Ganga Rejuvenation has been impressing upon the States/Union Territories (UTs) to formulate State Water Policies in line with the National Water Policy, 2012 and has been pursuing the same during different conferences / meetings with States/UTs.”

3.61 A statement indicating the details of States/UTs which have formulated / are in the process of formulating State Water Policies is given in the Table below:

Table – 9: Table showing details of States/UTs which have formulated / are in the process of formulating State Water Policies

| Sl. No. | Name of the States / UTs |
|---------|---|
| A. | States which have already formulated their State Water Policy |
| | 1. Andhra Pradesh |
| | 2. Chhattisgarh |
| | 3. Goa |
| | 4. Himachal Pradesh |
| | 5. Jharkhand |
| | 6. Karnataka |
| | 7. Kerala |
| | 8. Madhya Pradesh |
| | 9. Maharashtra |
| | 10. Odisha |
| | 11. Rajasthan |
| | 12. Sikkim |
| | 13. Tamil Nadu |
| | 14. Uttar Pradesh |
| B. | States / UTs which had adopted the National Water Policy |
| | 15. Daman and Diu |
| | 16. Dadra & Nagar Haveli |
| | 17. Delhi |

| | |
|----|--|
| C. | States / UT which are in the process of formulating State Water Policy |
| | 18. Arunachal Pradesh |
| | 19. Assam |
| | 20. Bihar |
| | 21. Gujarat |
| | 22. Haryana |
| | 23. Jammu & Kashmir |
| | 24. Manipur |
| | 25. Meghalaya |
| | 26. Mizoram |
| | 27. Nagaland |
| | 28. Punjab |
| | 29. Tripura |
| | 30. Uttarakhand |
| | 31. West Bengal |
| | 32. Andaman & Nicobar |
| | 33. Chandigarh |
| | 34. Lakshadweep |
| | 35. Puducherry |

The State of Himachal Pradesh has formulated the Himachal Pradesh State Water Policy, 2013 on the lines of the National Water Policy, 2012. The Government of NCT of Delhi has circulated a Draft Water Policy for Delhi, 2014 for comments.

3.62 It is stated that since 'water' is a State subject, the Centre's role comes only in respect of inter-State rivers. On being asked whether a constitutional amendment will be needed to bring water in the Concurrent List, the Ministry of Environment, Forests and Climate Change had submitted during oral evidence held on 27.01.2015 that "it is really a huge task, but I think the time has come for us to take it extremely serious because we will not have water in many parts of the country".

3.63 During oral evidence, when asked whether any legislative process has been initiated by the Government to bring 'Water' to the Concurrent List of the Constitution, the Ministry of Water Resources, River Development & Ganga Rejuvenation submitted a written reply as under:

"The matter regarding bringing 'Water' in the Concurrent List has been raised from time to time. There has been growing demand by the professionals and civil society to bring 'water' in Concurrent List, primarily to ensure national perspective on water management and to avoid Inter-State disputes and the tendencies of the State Governments to use more water (in excess of justified needs through efficient use) only to claim more apportionment of water in inter-State rivers. However, the proposal to bring 'water' in Concurrent List has been opposed by most of the States.

The matter regarding making 'Water' a Union / Concurrent List Subject was examined by the two Commissions on Centre-State Relations chaired by Justice R.S. Sarkaria (1983-88) and Justice M.M. Punchhi (2007-10). The said proposal did not find favour with either of the two Commissions.

The matter requires extensive deliberations with the States and other stakeholders so that a broader consensus emerges in the matter."

Blocks/Areas with improved ground water situation

3.64 The Committee asked during the oral evidence held on 27.01.2015 to specify blocks/areas where improvement in ground water situation has been observed due to various interventions. To this query, the Ministry of Water Resources, River Development & Ganga Rejuvenation, in a written reply, submitted as follows:

"1. Gujarat

Two talukas that have shown improvement from 'Over-exploited' to 'Critical' / 'Semi-Critical' because of various interventions like artificial recharge, change in irrigation practices, etc.

(a) Taluka: Porbandar, Dist: Porbandar

'Over-exploited' (GWRE 2009) to 'Semi-Critical' (GWE 2011)- Due to artificial recharge by spreading channels.

(b) Taluka: Dholka, Dist: Ahmedabad

'Over-exploited' (GWRE 2009) to 'Critical' (GWRE 2011) - Due to change in irrigation practices.

2. Karnataka

(a) Bailahongal Taluk, Non-Command, Belgaum

'Over-exploited' (GWRE 2009) to 'Safe' (GWRE 2011) - Due to construction of check dams. Rain water harvesting watershed treatment, soil conservation and encouraging drip irrigation have also helped in improving the ground water scenario in the taluk.

(b) Bailahongal Taluk, Command, Belgaum

'Over-exploited' (GWRE 2009) to 'Safe' (GWRE 2011) - Due to construction of check dams. Rain water harvesting watershed treatment, soil conservation and encouraging drip irrigation have also helped in improving the ground water scenario in the taluk.

3. Telangana

Midjil Mandal, Mahabubnagar

'Over-exploited' (GWRE 2009) to 'Safe' (GWRE 2011) - Due to change in irrigation practices, construction of artificial recharge structures, Minor Irrigation Tanks."

CHAPTER – IV

CONTAMINATION OF UNDERGROUND WATER AND GOVERNMENT MEASURES

4.1 As per the Background Note provided by the Central Pollution Control Board (CPCB) of the Ministry of Environment, Forests & Climate Change (MoEF&CC), an alarming picture is beginning to emerge in many parts of the country in respect of the slowly but surely declining ground water quality.

Nature, sources and types of ground water contamination

4.2 The Central Pollution Control Board have inter alia stated that essentially, all activities carried out on land have the potential to contaminate the ground water, whether associated with urban, industrial or agricultural activities. But a vast majority of ground water quality problems are caused by contamination, over-exploitation, or a combination of the two. Large-scale, concentrated sources of pollution such as industrial discharges, landfills and sub-surface injection of chemicals and hazardous wastes, are an obvious source of ground water pollution. The CPCB has further stated that ground water pollution is intrinsically difficult to detect, since the problem may well be concealed below the surface and monitoring is costly, time-consuming and somewhat 'hit-or-miss' by nature. Many times, the contamination is not detected until obnoxious substances actually appear in water used, by which time the pollution has often dispersed over a large area. Further, concentrated sources can be detected and regulated, but the more difficult problem is associated with diffuse sources of pollution like leaching of agro-chemicals and animal wastes, sub-surface discharges from latrines and septic tanks, and infiltration of polluted urban run-off and sewage where sewage does not exist is defunct. Diffuse

sources can affect entire aquifers, which is difficult to control and treat. Once pollution has entered the sub-surface environment, it may remain concealed for many years, becoming dispersed over wide areas and rendering ground water unsuitable for human uses.

4.3 According to the Ministry of Agriculture, non-point pollution caused by imbalance and excessive use of chemical fertilizers and pesticides used in agriculture, often dispersed over large areas, is a great threat to fresh ground water ecosystems. Intensive use of chemical fertilizers in farms and indiscriminate disposal of human and animal waste on land result in leaching of the residual nitrate causing high nitrate concentrations in ground water. Nitrate concentration has been noticed to be above the permissible level of 45 PPM in 11 States, covering 95 districts and two blocks of Delhi. DDT (dichlorodiphenyltrichloroethane), BHC (Benzene hexachloride), carbamate, endosulfan, etc. are the most common pesticides used in India.

4.4 Further, the ground water extraction from tube-wells from irrigation is adding large quantities of arsenic every year (around 1000 tons) in agricultural fields, resulting in high built-up of arsenic in soils and subsequent accumulation in crop and vegetables. It was also stated that the high profile of fluoride in shallow-zone underground water is due to geochemical disposition in the vicinity of the ground water structure. The incidence of fluoride above permissible levels of 1.5 ppm occur in 14 States, namely Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal, affecting a total of 69 districts, according to estimates available to the Ministry of Agriculture. High levels of arsenic above the permissible levels are found mainly in the alluvial plains of Ganges covering 86 districts in 10 States across the country.

Causes of Arsenic and Fluoride contamination

4.5 When the Committee asked about the causes of Arsenic and Fluoride contamination of ground water in various parts of India, the Ministry of Water Resources, River Development & Ganga Rejuvenation submitted:

“Elevated level of Arsenic in ground water or Arsenic contamination is caused largely by natural processes (geo-genic) and partly due to anthropogenic activities like application of fertilisers, burning of coal, leaching from coal-ash tailings and from mining activity. Fluoride contamination in ground water is mainly geo-genic, wherein, during weathering and circulation of water in rocks and soils, fluoride is leached out and dissolved in ground water and thermal gases. The Fluoride content of ground water varies greatly depending on the geological settings and types of rocks. Agricultural (use of phosphate fertilizers) and industrial activities (clays used in ceramic industries or burning of coals) also contribute to fluoride concentration in ground water.”

4.6 The Ministry of Drinking Water & Sanitation informed the Committee that nearly 85% of rural drinking water supply in the country is based on ground water. Over-exploitation and subsequent ground water development is inducing more chemical contamination in aquifers.

Contamination of Ground Water by industries

4.7 During the oral evidence held on 27.01.2015, the representative of the Central Pollution Control Board of the Ministry of Environment, Forests & Climate Change informed the Committee that the industries responsible for ground water as well as surface water pollution fall broadly in the categories of slaughter houses, distilleries, pulp and paper, tanneries, textiles, chemicals and

dyeing industries. Detailing the industries responsible for pollution in water (ground & surface), the Central Pollution Control Board (CPCB) of the Ministry of Environment, Forests & Climate Change also informed, in a written reply, that there are 17 categories of highly polluting industries identified to ensure compliance of environmental standards. These industrial categories are: (1) Aluminium smelting, (2) Basic drugs and pharmaceutical manufacturing, (3) Chlor alkali, caustic soda, (4) Copper smelting, (5) Cement (200 TPD and above), (6) Dyes and dye intermediates, (7) Fermentation (distillery), (8) Fertilizer, (9) Integrated iron and steel, (10) Leather processing, including tanneries, (11) Oil refinery, (12) Pesticide formulation and manufacturing, (13) Pulp and paper (30 TPD and above), (14) Sugar, (15) Petrochemical, (16) Thermal power plants, and (17) Zinc smelting.

4.8 It was also informed during the oral evidence cited above that the CPCB had undertaken a comprehensive environmental assessment of 88 industrially polluted clusters in the country based on a concept called Comprehensive Environmental Pollution Index (CEPI), based on which 43 industrial clusters in 16 States have been classified as critically polluted areas with CEPI scores of 70 and above. The Ministry, in a written reply, also submitted that the CEPI is a rational number to characterize the environmental quality (air, surface water and ground water) at a given location.

4.9 The State/UT-wise list of critically polluted industrial areas is given in the Table below:

Table – 10: State/UT-wise list of critically polluted industrial areas

| Name of States | No. of clusters |
|----------------|-----------------|
| Andhra Pradesh | 2 |
| Chhattisgarh | 1 |
| Delhi | 1 |
| Gujarat | 6 |

| | |
|----------------|----|
| Haryana | 2 |
| Jharkhand | 1 |
| Karnataka | 2 |
| Kerala | 1 |
| Madhya Pradesh | 1 |
| Maharashtra | 5 |
| Odisha | 3 |
| Punjab | 2 |
| Rajasthan | 3 |
| Tamil Nadu | 4 |
| Uttar Pradesh | 6 |
| West Bengal | 3 |
| Total | 43 |

Distribution of water quality affected habitations

4.10 The Ministry of Drinking Water & Sanitation informed that as per online 'Integrated Management Information System' (IMIS) as on 18 May, 2015, States have reported 63,282 water quality-affected rural habitations (Arsenic -1482, Fluoride – 11309, Salinity – 16289, Iron – 32020, Nitrate – 2182) in the country. Further, as reported by the States on online IMIS of the Ministry, heavy / toxic metals have been found in nearly 8862 rural inhabitations, of which Punjab, Assam and West Bengal are the most affected States in terms of occurrence of emerging contaminants in drinking water sources.

4.11 The State-wise details of water quality affected habitations in India are given in the Table below:

Table - 11 : State/UT-wise details of water quality affected habitations in India

| Sl. No. | Name of States/UTs | Total habitations | Fluoride | Arsenic | Iron | Salinity | Nitrate |
|---------|--------------------|-------------------|----------|---------|------|----------|---------|
| 1. | Andhra Pradesh | 1336 | 657 | 0 | 66 | 507 | 106 |

| | | | | | | | |
|-----|-------------------|-------|------|-----|------|-------|------|
| 2. | Bihar | 3394 | 512 | 95 | 2787 | 0 | 0 |
| 3. | Chhattisgarh | 2157 | 51 | 0 | 2064 | 42 | 0 |
| 4. | Goa | 0 | 0 | 0 | 0 | 0 | 0 |
| 5. | Gujarat | 13 | 0 | 0 | 0 | 0 | 13 |
| 6. | Haryana | 11 | 11 | 0 | 0 | 0 | 0 |
| 7. | Himachal Pradesh | 0 | 0 | 0 | 0 | 0 | 0 |
| 8. | Jammu & Kashmir | 8 | 2 | 0 | 6 | 0 | 0 |
| 9. | Jharkhand | 24 | 9 | 0 | 15 | 0 | 0 |
| 10. | Karnataka | 1319 | 586 | 9 | 277 | 198 | 249 |
| 11. | Kerala | 779 | 91 | 0 | 534 | 109 | 45 |
| 12. | Madhya Pradesh | 1109 | 635 | 0 | 437 | 37 | 0 |
| 13. | Maharashtra | 644 | 200 | 0 | 63 | 179 | 202 |
| 14. | Odisha | 5353 | 256 | 0 | 4482 | 608 | 7 |
| 15. | Punjab | 18 | 1 | 1 | 16 | 0 | 0 |
| 16. | Rajasthan | 22325 | 6808 | 0 | 9 | 14096 | 1412 |
| 17. | Tamil Nadu | 350 | 0 | 0 | 299 | 50 | 1 |
| 18. | Telangana | 1388 | 1008 | 0 | 47 | 192 | 141 |
| 19. | Uttar Pradesh | 416 | 144 | 38 | 29 | 203 | 2 |
| 20. | Uttarakhand | 27 | 2 | 0 | 22 | 0 | 3 |
| 21. | West Bengal | 10349 | 227 | 980 | 9074 | 67 | 1 |
| 22. | Arunachal Pradesh | 71 | 0 | 0 | 71 | 0 | 0 |
| 23. | Assam | 8755 | 109 | 359 | 8287 | 0 | 0 |
| 24. | Manipur | 0 | 0 | 0 | 0 | 0 | 0 |

| | | | | | | | |
|-----|----------------------|-------|-------|------|-------|-------|------|
| 25. | Meghalaya | 33 | 0 | 0 | 33 | 0 | 0 |
| 26. | Mizoram | 0 | 0 | 0 | 0 | 0 | 0 |
| 27. | Nagaland | 16 | 0 | 0 | 16 | 0 | 0 |
| 28. | Sikkim | 0 | 0 | 0 | 0 | 0 | 0 |
| 29. | Tripura | 3378 | 0 | 0 | 3378 | 0 | 0 |
| 30. | Andaman & Nicobar | 0 | 0 | 0 | 0 | 0 | 0 |
| 31. | Chandigarh | 0 | 0 | 0 | 0 | 0 | 0 |
| 32. | Dadra & Nagar Haveli | 0 | 0 | 0 | 0 | 0 | 0 |
| 33. | Daman & Diu | 0 | 0 | 0 | 0 | 0 | 0 |
| 34. | Lakshadweep | 0 | 0 | 0 | 0 | 0 | 0 |
| 35. | Puducherry | 9 | 0 | 0 | 8 | 1 | 0 |
| | Total | 63282 | 11309 | 1482 | 32020 | 16289 | 2182 |

4.12 The Ministry of Water Resources, River Development & Ganga Rejuvenation, in a written note, stated that excessive intake of Fluoride in drinking water causes dental fluorosis and leads to severe and permanent bone and joint deformations of skeletal fluorosis. Consumption of excess Arsenic in drinking water causes hyperkeratosis and can lead on to skin cancer. Arsenic may attack internal organs without causing any visible external symptoms, making Arsenic poisoning difficult to recognize.

Measures taken by Government of India

- (i) Initiatives under Ministry of Water Resources, River Development & Ganga Rejuvenation/Ministry of Environment, Forests & Climate Change

4.13 When the Committee asked about the remedial action taken by the Government to tackle ground water pollution by certain categories of industries, the Ministry of Water Resources, River Development & Ganga Rejuvenation submitted in a written reply as under:

“Various efforts made by the Government for management of industrial pollution include notifying industry specific effluent standards, promoting setting up of Common Effluent Treatment Plants (CETPs) and Environmental Surveillance of industries by CPCB, SPCBs and Pollution Control Committees. SPCBs are required to implement the effluent discharge standards by the industries. Action must be taken against the defaulting industries by the SPCBs under powers delegated to them by the Central Government under relevant provisions of the Water (Prevention & Control of Pollution) Act, 1974 and the Environment (Protection) Act, 1986.

CPCB has directed the SPCBs/PCCs to install 24x7 real time monitoring devices at effluent and emission discharge points in industrial units throughout the country. Out of 2800 industries to which directions were issued, nearly 50 per cent of the industrial units have moved towards compliance. More than 920 industries have installed 24x7 monitoring devices and another 400 units have moved towards Zero Liquid Discharge (ZLD). Online monitoring data communication has been started by the industries to CPCB/SPCBs on the status of compliance with respect to effluents and emissions.

New industrial units in Distillery, Textile, Tannery, Chemicals, Fertilizers, Dyes and Pharmaceuticals have been mandated to achieve ZLD from the commissioning along with installation of 24x7 monitoring systems. The existing units in these sectors are required to switch over to ZLD in a time-bound manner and are required to install web-cameras instead of continuous effluent monitoring devices. Similarly, there are another 440 industries which are small in nature and their discharge is treated through Common Effluent Treatment Plants (CETPs) which will be monitored 24x7 through devices to be installed at both inlets and outlets.”

4.14 When asked to give the salient features of action plans being implemented by the Government in respect of the 43 critically polluted (industrial) areas, the Ministry of Water Resources, River Development & Ganga Rejuvenation submitted as under:

“Comprehensive remedial action plans for the identified 43 critically polluted industrial clusters were prepared by SPCBs concerned. All the aspects like industrial pollution control, hazardous waste management, bio-medical waste management, municipal solid waste management, sewage management, vehicular pollution control, traffic management, technological intervention and various environmental issues have been incorporated in these action plans. The effective implementation of these remedial action plans will help in the abatement of pollution and thereby, restore the environmental quality of industrial clusters.”

4.15 The representative of the Central Pollution Control Board of the Ministry of Environment, Forests & Climate Change also stated during evidence held on 27.01.2015 that ground water quality monitoring was conducted during 2013 in these 43 critically polluted areas. It was observed that while the ground water quality in 19 critically polluted areas meet the prescribed standards, this has not been the case in the rest of the 24 critically polluted areas. Major steps have been taken for preventing ground water pollution from industries. Specific effluent standards ETP and CTP (Common Treatment Plant) for respective industries have been notified for treatment of effluent generated.

4.16 When the Committee asked whether the ground water quality is monitored annually by CPCB, the Ministry of Water Resources, River Development & Ganga Rejuvenation furnished the following reply:

“Environmental quality monitoring (Air, Surface Water, Ground Water) is being carried out by CPCB through reputed environmental labs periodically. So far, three rounds of monitoring have been undertaken by CPCB (2009, 2011, 2013).”

4.17 The Ministry of Water Resources, River Development & Ganga Rejuvenation also furnished State/UT-wise details of the 24 critically polluted areas where ground water contamination is observed with respect to one or more parameters, which are reproduced in the Table below:

Table – 12: State/UT-wise details of the 24 critically polluted areas

| Name of States | Critically Polluted Area |
|----------------|---------------------------------------|
| Andhra Pradesh | Patancheru Bollaram, Visakhapatnam |
| Haryana | Faridabad, Panipat |
| Karnataka | Bhadravathi, Mangalore |
| Kerala | Greater Cochin |
| Maharashtra | Aurangabad, Tarapur, Chandrapur, |
| Jharkhand | Dhanbad |
| Rajasthan | Bhiwadi, Jodhpur, Pali |
| Tamil Nadu | Coimbatore, Cuddalore |
| Uttar Pradesh | Agra, Ghaziabad, Singrauli*, Varanasi |
| Punjab | Ludhiana, Mandi Gobindgarh |
| Delhi | Najafgarh Drain Basin |
| Chhattisgarh | Korba |

* Singrauli – covering Uttar Pradesh & Madhya Pradesh

4.18 When asked about the specific steps taken or are being proposed by the Government to tackle ground water contamination in these 24 critically polluted areas, the Ministry of Water Resources, River Development & Ganga submitted that remedial action plans were already formulated for the 24 Critically Polluted Areas (CPAs) by SPCBs concerned and are currently at various stages of implementation. The effective implementation of these action plans will improve the environmental quality of the CPA, which includes ground water. The year-wise

expenditure incurred towards monitoring in CPAs through reputed environmental labs periodically are Rs. 21.43 Lakh (2009), Rs. 78.34 Lakh (2011) and Rs. 56.0 Lakh (2013).

4.19 Asked to give the response of the industries in these 24 critically polluted areas to the notifications issued by CPCB till now, the Ministry replied as under:

“Till date, directions have been issued by CPCB to all the concerned SPCBs of 43 CPAs for installation of Continuous Ambient Air Quality Monitoring Stations and Continuous Water Quality Monitoring Stations in each of the 43 CPAs.”

4.20 The representative of the Central Pollution Control Board of Ministry of Environment, Forests & Climate Change informed the Committee during oral evidence held on 27.01.2015 that in some specific areas, ground water has been studied / monitored. However, this monitoring is being carried out only in 807 locations.

4.21 When the Committee asked whether the 807 monitoring stations are adequate for the requirement, the Ministry of Water Resources, River Development & Ganga Rejuvenation furnished the following written reply:

“The present network is highly inadequate and its expansion is not feasible in view of available resources. In view of this, an MoU between CPCB and CGWB have been framed to assess the water quality and to assess the larger data base on Water Quality Monitoring Network.”

4.22 Asked what action has been taken or is being proposed to extend the monitoring stations in the country, the Ministry of Water Resources, River Development & Ganga Rejuvenation replied that in view of the limited number of locations under water quality monitoring programme of CPCB, an MoU has been signed with CGWB for sharing the information and preparation of water quality improvement plan as per the provisions of the Environmental Acts. The salient features of the MoU between CPCB and CGWB are as follows:

- (i) The proposed MoU on ground water quality monitoring and remediation of contamination aims to avoid repetition of quality monitoring in the observation wells by both the organizations.
- (ii) Both organizations will share the water quality data and the remedial measures of pollution studies taken up in isolation or jointly.
- (iii) The common programme for CPCB and CGWB for monitoring geogenic and anthropogenic contamination by using the resources available with both the organizations will help in identifying specific locations having significantly high concentration of any particular pollutant. Specific locations may then be selected for executing pilot scale remediation.
- (iv) MoU will provide a platform for Central and State departments to share data with user agencies.

4.23 When asked about specific action taken by the Government to tackle the problem of arsenic and fluoride contamination of ground water, the Ministry of Water Resources, River Development & Ganga Rejuvenation informed as under:

“Water being a State subject, measures for safe water supply are being undertaken by the State Governments concerned. Government of India through MoDWS supplements the efforts of the States by providing them technical and financial support to the schemes being developed for drinking water supply in the States under NRDWP programme.

Under NRDWP programme, States can utilize upto 67% of funds released to them for provision of safe drinking water in water quality affected habitations. States may also like to set up community water purification systems as a short/medium term measure for immediate provision of safe drinking water as powers to plan, design, implement and monitor water supply projects, including water treatment plants, have been delegated to them. Further, 5% of the NRDWP funds are earmarked for Water Quality and allocated to those States with habitations affected by excess chemical contamination and with high priority districts affected by Japanese Encephalitis/Acute Encephalitis Syndrome. In addition, 3% of funds allocated to the States are

earmarked for water quality monitoring and surveillance activities on a 100% Central share basis which, inter alia, includes testing of drinking water sources at the Panchayat level by using simple field test kits, upgrading of existing water quality testing laboratories and setting up of new State/district/sub-district water quality testing laboratories, wherever such facility is not available or needed.

CGWB carries out ground water monitoring through network of ground water quality observation wells along with ground water exploration and various special studies in different parts of the country to assess the ground water quality. CGWB has identified areas with High Arsenic and Fluoride contamination and information is shared with State Government concerned to take necessary remedial measures. CGWB provides technical guidance to State agencies in tackling the problem of water quality. CGWB identifies deeper Arsenic free aquifers as an alternative source, under normal ground water exploration programme by using the cement sealing technique. Wells free from Arsenic and Fluoride contamination are handed over to the State Water Supply agencies for purposeful utilization.

During the 12th Plan, under the Aquifer Mapping and Management Programme, CGWB has taken up aquifer mapping programme in Arsenic affected areas, wherein, assessment of aquifer-wise water quality and development of management plans are envisaged. These information will be shared with the Central and State agencies concerned for taking remedial measures."

4.24 On being asked about any authority established or any study initiated to analyze the issue of ground water contamination till date, the Ministry informed as follows:

"A task force has been constituted for countering ill effects of occurrence of high Arsenic content in ground water (Notification dated 25.11.2014) under the Chairmanship of Director General, Indian Council of Medical Research (ICMR), Ministry of Health & Family Welfare. One of its Members is from CGWB as nominated by Secretary, Ministry Water Resources, River Development & Ganga Rejuvenation. The task force will work out the modalities of robust mapping of areas affected by high Arsenic content in ground water and will suggest an intervention strategy to address

health issues arising out of high Arsenic content in ground water, including treatment protocols. In addition, this task force will also suggest methods for carrying out intensive awareness activities with regard to drinking contaminated water and will suggest methods of working with allied departments. An Inter- Ministerial Group (IMG) for 'Arsenic Mitigation' under the Chairmanship of Mission Director, National Water Mission, Ministry Water Resources, River Development & Ganga Rejuvenation, also has been constituted on 22nd December 2014. Recently, a Meeting was held regarding preparation of action plans and Budget requirement to be earmarked for the purpose."

4.25 The Ministry of Water Resources, River Development & Ganga Rejuvenation further supplemented as follows:

"...Government of India through Ministry of Drinking Water & Sanitation (MoDWS) provides technical and financial support to the schemes being developed for drinking water supply. Under the National Rural Drinking Water Programme (NRDWP), 20 % of the NRDWP funds are allocated to the States exclusively for tackling water quality problems. Further, 75 % of 5 % of NRDWP funds is also earmarked for providing safe drinking water in chemical contamination-wherein Fluoride and Arsenic have been accorded highest priority... Central Ground Water Board (CGWB) has recently carried out water quality studies in all the 88 industrial clusters identified by Central Pollution Control Board (CPCB). The studies indicated that in most of the cases excess concentration of few chemical constituents beyond norms prescribed by Bureau of Indian Standards (BIS) are present. The results of above studies are shared with State Government Departments concerned for taking necessary remedial measures. The prevention of pollution (anthropogenic) comes under the purview of Central/ State Pollution Control Boards.

Under Aquifer Mapping and Management Programme, CGWB has taken up aquifer mapping programme in priority areas such as 'Over-exploited', 'Critical', 'Semi critical', quality affected areas, area identified by MoDWS and the water scarce Bundelkhand region, wherein assessment of aquifer-wise water quality and development of

management plans are envisaged. These information will be shared with the Central and State agencies concerned for taking remedial measures.

Central Ground Water Board under IEC Scheme of the Ministry of Water Resources organizes various training and mass awareness programmes wherein ground water quality issues are addressed for mitigation and preventive measures.”

4.26 The Committee wanted to know about action taken in respect of industrial wastes in the country. To this query, the Ministry of Water Resources, River Development & Ganga Rejuvenation informed the Committee as under:

“Central Pollution Control Board (CPCB) has carried out an inventorization of Sewage Treatment Plants (STPs) located in India in the year 2014-15. CPCB has circulated the format for inventorization to all 35 State Pollution Control Boards and Pollution Control Committees. There are 899 STPs having capacity of 24,578 MLD in 30 States/UTs of India. Out of 899 STPs, 605 STPs are operational, 77 STPs are Non-operational, 149 STPs are under construction and 68 STPs are proposed for construction.”

(ii) Initiatives under Ministry of Agriculture

4.27 The Ministry of Agriculture informed that based on the research findings, the Indian Council of Agricultural Research (ICAR) has suggested several measures to mitigate arsenic build-up in soils and crops. When asked to apprise the Committee about the extent to which the remedial measures have been implemented in the country for mitigating arsenic build-up in soils and crops, the Ministry of Agriculture informed:

“In order to minimize build-up of arsenic in soils and subsequent accumulation in crops and vegetables consequent to irrigation with arsenic laden ground water, the ICAR has recently recommended conjunctive use of fresh surface water and poor quality ground water along with other agronomic measures such as raising low water consuming crops, application of vermin-compost, FYM, green manure and zinc sulphate. These recommendations have already been forwarded to State Governments to incorporate in

their crop husbandry programmes besides creating training & awareness. ICAR has further been requested to undertake more research and provide DAC (Department of Agriculture & Cooperation) the outcome for adoption in the field to minimize the adverse effect of contamination of water source of arsenic."

(iii) Initiatives under Ministry of Urban Development

4.28 According to the Ministry of Urban Development, untreated sewage is a major source of pollution of water bodies and thereby the underground water also. The States/cities are required to collect 100% sewage, treat it and discharge into the environment with effluent meeting the environmental standards set by the Central/State Pollution Control Board. The Ministry of Urban Development also stated that they supplement efforts of States/Urban Local Bodies (ULBs) in implementing water supply and sewerage projects. For water supply, 749 nos. water supply projects have been approved at a cost of Rs. 35,250.77 crore while 242 nos. sewerage projects were approved at a cost of Rs. 20,576.32 crore.

4.29 On being asked during oral evidence held on 16.02.2015 regarding the role played by MNREGA in this regard, the representative of the Ministry of Urban Development informed the Committee that from 2005 to 2012, 749 projects relating to water resources were sanctioned. These projects were for an amount of Rs. 35250.77 crore. Besides 242 projects relating to sewerage involving Rs. 20576.00 crore were sanctioned. All these projects are not completed. The Government had taken a decision to grant an extension of 2 years i.e., till March, 2014 to the projects - which were sanctioned upto 2012. Uptill this time, whatever assistance the State Government were to obtain from the Union Government, had been obtained. Those projects which are incomplete can be completed by the State Governments. Besides this the projects which were incomplete, they are to be got completed by the State Governments from their own

resources. Some projects pertaining to water supply and sewage were again sanctioned during the transition period of 2013-14.

Besides under JNNURM, the Government has decided in respect of 500 cities as a part of Urban Infrastructure Rejuvenation Mission for which approval has been obtained from the Cabinet. In addition, cities having population of more than one lakh and important cities have also been included. When the guidelines will be issued then all this will be brought to light. This is an important component of water resources. I would like to inform you two-three points for your information. In September, 2008 the Government of India had issued a benchmark regarding water supply. It is to be seen whether the upcoming projects follow the guidelines or not. The guidelines being that there should be a 100% water supply connection cover; the cities should have a minimum of 135 lpcd litre per capita water supply; there should be 100% metering. A study was conducted which detected the reasons for water supply. As per the 12th Schedule of the Constitution, the responsibility for the works related to water supply is vested with Municipality. The Government of India merely does the work of head-holding. Otherwise the entire responsibility lies with the State Government and the urban local bodies. It has been seen in this regard that due to the absence of water meters, there would have been enough non-revenue water. The rate of revenue received from such water is so meager even to meet the expenses of O&M maintenance of the Department. Due to this, the water supply projects are not sustainable. To remove all these defects, a service benchmark has been levied on September, 2008. There is a department in Ministry of Urban Development viz. CPHEE organisation which oversees the water supply projects. The Urban Rejuvenation Mission introduced by the new Government, focuses on PPP model. Earlier our projects were constructed for the purposes of

infrastructure, but no responsibility has been fixed. The Government is focusing on PPP model so that O&M can run on well and water supply be made sustainable.

(iv) Initiatives under Ministry of Commerce & Industry

4.30 According to the Ministry of Commerce & Industry, there are four pathways for contaminating groundwater, viz. (a) industrial (liquid) waste water entering the ground water, (b) improper treatment or mishandling of solid waste generated as a by-product of the industrial process or waste treatment, (c) Leachate entering groundwater, and (d) raw material stored on site can be leaked into groundwater. When the Committee asked whether the Ministry of Commerce and Industry have taken steps/ policy initiatives to monitor, regulate and prevent groundwater contamination by industries in the country, the Ministry of Commerce & Industry furnished as under:

“Pollution control and ground water contamination are monitored and regulated by the Central or State Pollution Control Boards and Central Ground Water Board. So, the subject falls under the purview of Ministry of Environment, Forest and Climate Change. However, as part of the Indian Leather Development Programme (ILDPP) being implemented by the DIPP, the sub-scheme titled ‘Leather Technology, Innovation and Environmental Issues’ (LTIEI) aimed at addressing environmental concerns in the Leather Sector inter-alia provides for financial support to SPVs in leather industry for inter-alia setting up/upgrading of Common Effluent Treatment Plants (CETPs), Developing Secured Landfills and other techniques for hazardous waste management. For establishing Zero Liquid Discharge (ZLD) in CETPs, DIPP has provided assistance under Indian Leather Development Programme (ILDPP) scheme for six CETPs in Ranipet (3), Vellore (1), Dindigul (1) and Pallavaram (1) for installing ZLD systems.”

4.31 On being further asked whether any study has been conducted for identifying areas affected by groundwater contamination from industrial activities, the Ministry of Commerce & Industry replied that no such study has been conducted by DIPP.

(v) Initiatives under Ministry of Drinking Water & Sanitation

4.32 When asked about the steps taken / are being proposed to be taken by the Ministry of Drinking Water & Sanitation to tackle chemical contamination in aquifers till date, the Ministry replied as under:

“Amongst the five major chemical contaminants which the Ministry monitors regularly, arsenic and fluoride have direct bearing on human health and therefore they are focused for coverage at an early date. The Ministry advised all States to go in for surface water based piped water supply (PWS) for providing safe drinking water in these water quality affected areas. As a short term measure, States have also been advised to provide community water purification plants for provision of safe water for drinking and cooking purposes.”

4.33 Regarding the outcome of the steps taken, the Ministry of Drinking Water & Sanitation further stated:

“Most of the State Governments have shifted their schemes towards surface water based piped water supply schemes especially in water quality affected areas. In States like Karnataka where fluoride is a major problem, they have also installed 1,320 reverse osmosis (RO) plants. In States like Punjab, where heavy metals like uranium is a problem, (they) have also commissioned 1,876 community water purification plants adopting reverse osmosis technology. In States like West Bengal and Assam where arsenic is a major problem, (they) have moved towards provision of surface water based piped water supply schemes. In States like Uttar Pradesh, where again arsenic is a major problem, (they) have capped arsenic rich upper aquifer and tapped arsenic free lower aquifer.”

4.34 The Ministry of Drinking Water & Sanitation have also advised the States recently to monitor emerging contaminants such as heavy /toxic metals, pesticides and fertilizers, etc., in drinking water sources in rural areas in country. When asked about any special initiatives taken to tackle this problem in the worst-affected States of Punjab, Assam and West Bengal, the Ministry of Drinking Water and Sanitation, in a written reply, submitted:

"The Ministry of Drinking Water & Sanitation has advised the States to provide safe drinking water in all identified water quality affected rural habitations from alternate safe water sources with piped water supply schemes. However, piped water supply schemes generally take around 4-5 years and the people cannot be put to the risk of consuming contaminated drinking water. Considering this, the Ministry has decided to install community water purification plants to provide 8-10 lpcd of drinking water as a short term measure. So far, 1,876 RO plants have been installed in Punjab State for providing safe water for drinking and cooking purposes."

Arsenic and Fluoride contaminations in West Bengal

4.35 The Committee wanted to have brief reports about the problem of ground water contaminations in two districts of West Bengal, i.e. Fluoride contamination in Birbhum district and Arsenic contamination in Murshidabad district. To this query, the Ministry of Water Resources, River Development & Ganga Rejuvenation furnished replies, the gists of which have been summarized as under:

(i) Fluoride contamination in Birbhum district.

4.36 According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, Fluoride contamination of ground water in West Bengal was first detected during 1997 at Nasipur area of Nalhati-I Block in the district of Birbhum. Groundwater in 7 blocks, namely, Khyrasol, Rajnagar, Sainthia, Suri-II, Mayureswar-I, Nalhati-I and Rampurhat-I is

affected sporadically by high concentration of fluoride, i.e. more than the permissible limit (>1 mg / l (WHO standar) and >1.5 mg/l (BIS standard). The main sources of fluoride in ground water are the flouoride bearing minerals in the rocks and sediments from which it gets weathered and / or leached out and contaminate the water. When water percolates through rocks it leaches out the fluoride from these rocks. As remedial measures, a Fluoride Committee was constituted under the Public Health Engineering Department, Government of West Bengal, during 2003 and a Rapid Assessment of Fluoride Contamination in Ground Water was taken up with the assistance from UNICEF. A Joint Plan of Action in consultation with the Fluoride Committee has been taken up with UNICEF which encompasses complete testing of all the public tube wells in the affected blocks and take mitigation measures, including (i) provision of alternate safe source in place of unsafe sources, (ii) surface water based water supply schemes, (iii) Hand Pump attached Fluoride Removal Plants, (iv) Big Dia Tube well based Piped Water Supply Schemes, (v) Rain Water Harvesting, (vi) Household treatment, (vii) identification of Fluorosis cases at early stage and remedial measures, and (viii) communication and awareness generation. A Fluoride Task Force was constituted by the State Government in 2007, whose terms of reference include mapping of fluoride affected areas in West Bengal showing the extent of fluoride contamination, cause of fluoride contamination in different parts of the State, etc. A Master Plan on fluoride mitigation, which is already under preparation, will be finalized as soon as the report of the Fluoride Task Force on technological option is published. The Action taken by CGWB included construction of 47 exploratory wells in Birbhum district, out of which 17 wells having fluoride free water have been handed over to the State authority, and Artificial Recharge Study under Central Sector Scheme by State Water Investigation Directorate in Nalhati-I and Murarai-I block of

Birbhum district in an effort for dilution of fluoride contamination in ground water in shallower zone by augmenting ground water by artificial recharge in the fluoride affected area.

(ii) Arsenic contamination in Murshidabad district

4.37 Arsenic contamination in ground water of sporadic nature has been reported in 21 blocks of Murshidabad district (Plate I), i.e. Raninagar-I, Raninagar-II, Domkal, Nowda, Jalangi, Hariharpara, Suti-I, Suti-II, Bhagwangola-I, Bhagwangola-II, Beldanga-I, Beldanga-II, Berhampur, Raghunathganj-I, Raghunathganj-II, Farakka, Lalgola, Mur-Jiaganj, Samsorganj, Kandi & Sagardighi. A total of 3997000 nos. of people (as per 2001 Census) in 1218 habitations are at risk zone. The concentration of arsenic in ground water ranges between 0.001 and 3.0 mg/l. The Ministry also stated that the hydrogeological and hydrochemical studies carried out in the areas having arsenic rich aquifers indicates that in majority of cases, arsenic contamination owes its origin to geological sources. With a view to tackling this arsenic menace in ground water over a wide area, the Government of West Bengal constituted a Working Group comprising of eminent experts in the related fields from both the State and Central Government organizations as well as from academic institutions to examine and investigate into the matter. Several programmes have been taken up by the Group (Arsenic Task Force) to overcome this menace, including supply of water for drinking purposes from ponds, rivers, etc. through pipe net work system after purification by conventional method of treatment, exploring and harnessing alternative arsenic free aquifer (if available), removal of Arsenic from ground water using Arsenic treatment plants / filters and adoption of rain water harvesting. CGWB, Kolkata has carried out detailed ground water exploration in arsenic affected parts of Murshidabad district exploring down to the depth of 350 mbgl (maximum) to identify arsenic free deeper aquifers, capable of yielding 5 to 20 lps arsenic free water. Till March, 2014, 43 exploratory wells (& 12 observation wells) in 14 blocks

have been constructed. So far, 22 arsenic free exploratory wells have been handed over and accepted by State Departments and 15 more such wells were handed over but acceptance from State departments is awaited. Further, to explore the efficacy of arsenic removal units in arsenic infected areas of West Bengal, a collaborative project has been conducted by CGWB with the United Nations Industrial Development Organisation.

Pollution of Ground Water in Greater NOIDA and NCR

4.38 The Committee specifically desired to know about the specific reasons for the deteriorating ground water quality in Greater NOIDA. The Ministry of Water Resources, River Development & Ganga Rejuvenation submitted:

“As per the latest Ground Water Resource Estimates -2011, Bisrakh Block is falling under ‘Over-exploited’ category. CGWA now issues ‘No Objection Certificates’ (NOC) to industries abstracting ground water in Bisrakh Block, in accordance with the provisions of Over Exploited blocks as given in ‘Guidelines/Criteria for Evaluation of Proposals/ Requests for Ground Water Abstraction’. As per the orders dated 14.5.2015 of Hon’ble NGT, Uttar Pradesh Pollution Control Board (UPPCB) has filed a status report in NGT, wherein, violation by eight industries has been detected. Hon’ble NGT has issued show cause notices returnable by 15.07.2015, as to why these industries should not be closed. Central Ground Water Board (CGWB) has carried out ground water quality sampling as a part of Aquifer Mapping and Management Programme during 2013-14, in Chapraula Industrial Area, Bisrakh block of Gautam Budh Nagar district. The samples were collected and analysed for basic cations & anions, heavy metals, bacteriological and pesticide residues. In addition, CGWB carried out a study on pesticide residue in Bisrakh Block during 2010-11. The inference of the analysis is given below:

- Basic Cations & Anions: The basic parameters of groundwater of subject area are generally within permissible limits.
- Heavy Metals (including Arsenic): Study carried out by CGWB shows that all analysed heavy metals (including arsenic) are generally within permissible limits, except in the

following instances: i) Iron, above permissible limit was reported from all samples. Aluminium above permissible limit was reported from Roopvas. Lead, marginally above permissible limit has been found in sample from Khera Chauganpur and Durai Taalpur. Nickel above maximum permissible limit was found in sample from Khera Chauganpur

- Pesticide Residue: As per the results of studies carried out by CGWB in Bisrakh block, all the analysed pesticide residues were found to be within permissible limits. However, in the samples collected by WAPCOS from Khera Chauganpur, pesticide residues were found to be above permissible limit.”

4.39 On being further asked to apprise the Committee of the action taken by the Government/ State Government/ CPCB/ Uttar Pradesh Pollution Control Board in this regard, the Ministry further submitted:

“As per the directions given by Hon’ble NGT, New Delhi to CPCB and UPPCB for inspection and filing the status report, the status report has been filed by UPPCB in the Hon’ble NGT on 14.5.2015. The matter is posted for next hearing on 15.07.2015. Further action shall be taken up on the directions of Hon’ble NGT after it has considered the replies submitted by the eight industries against whom show cause notices have been served by Hon’ble NGT, New Delhi.”

National Green Tribunal

4.40 The National Green Tribunal was established on 18.10.2010 under the National Green Tribunal Act, 2010(Act 19 of 2010) vide the Ministry of Law and Justice notification dated 02.06.2010, for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources, including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues.

The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice. Initially, the NGT is proposed to be set up at five places of sitting and will follow circuit procedure for making itself more accessible. New Delhi is the Principal Place of Sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai shall be the other four places of sitting of the Tribunal. NGT after its constitution has heard several cases and passed several orders/judgements, etc.

4.41 The Ministry of Water Resources, River Development & Ganga Rejuvenation, in a written reply, informed that the National Green Tribunal, at present on application/appeal, in exercise of powers and functions under the NGT Act, 2010, with rules made thereunder, is judiciously resolving the issues related to ground water management, monitoring and conservation, including ground water pollution/contamination with due regard to the provisions under the Environment (Protection) Act, 1986, with rules made thereunder, and the Water (Prevention and Control of Pollution) Act, 1974, with rules made thereunder.

Water Quality Assessment Authority

4.42 According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, the Water Quality Assessment Authority (WQAA) was constituted w.e.f. 29th May, 2001 under the Environment (Protection) Act, 1986 vide Extraordinary Gazette Notification by the Ministry of Environment & Forests, Government of India, New Delhi, under the Chairmanship of Secretary, Ministry of Environment & Forests. The Joint Secretary (Administration), Ministry of Water Resources, is the Member Secretary of the Authority. WQAA is an inter-ministerial body with members from 16 Ministries/organisations. Water Quality Cell, Ministry of Water Resources is providing secretariat services to WQAA and coordinates the activities of the constituent agencies of the Authority and undertakes various programmes/activities as decided by WQAA.

4.43 The Ministry also informed that WQAA is mandated to direct the agencies (government/local bodies/non-governmental) for the following:

- (a) To standardize method(s) for water quality monitoring and to ensure quality of data generation for utilization thereof;
- (b) To take measures so as to ensure proper treatment of wastewater with a view to restoring the water quality of the river/water bodies to meet the designated-best-uses;
- (c) To take up research and development activities in the area of water quality management;
- (d) To promote recycling/re-use of treated sewage/trade effluent for irrigation in development of agriculture;
- (e) To draw action plans for quality improvement in water bodies, and monitor and review/assess implementation of the schemes launched/to be launched to that effect;
- (f) To draw scheme for imposition of restriction in water abstraction and discharge of treated sewage/trade effluent on land, rivers and other water bodies with a view to mitigating crisis of water quality;
- (g) To maintain minimum discharge for sustenance of aquatic life forms in riverine system;
- (h) To promote Rain water harvesting; (This mandate has been deleted vide MoEF notification No. SO-728 (E) dated 25th May, 2005)
- (i) To utilize self-assimilation capacity at the critical river stretches to minimize cost of effluent treatment;
- (j) To provide information to pollution control authorities to facilitate allocation of waste load;
- (k) To review the status of quality of national water resources (both surface water and ground water except that due to geo-genic aspect)) and indentify "Hot Spots" for taking necessary actions for improvement in water quality;
- (l) To interact with the authorities/committees constituted or to be constituted under the provisions of the said Act for matters relating to management of water resources;
- (m) To constitute/set-up State-level Water Quality Review Committees (WQRC) to coordinate the work to be assigned to such committees; and
- (n) To deal with any environmental issue concerning surface and groundwater quality (except that due to geo-genic aspect) which may be referred to it by the Central Government or the State Government relating to the respective areas, for maintenance and/ or restoration of quality to sustain designated-best-uses.

4.44 When asked whether any review has been taken up regarding the effectiveness of WQAA, the Ministry, in a written reply, submitted as follows:

“WQAA felt the need for re-look of its powers and mandate and therefore, for rationalization of Terms of References (TOR's), a Sub-Committee was constituted under the chairpersonship of Advisor, NRCD, MoEF. The Sub-Committee submitted its report to WQAA. The report was discussed and accepted by the Authority in its 10th meeting. As per Sub-Committee's recommendations, WQAA should focus on assessment and monitoring of water quality and address all the related aspects holistically including the geo-genic contaminations aspects. A draft Gazette notification was then prepared with revised powers and mandate as decided by WQAA in its 10th meeting and submitted to Ministry of Law and Justice for vetting during July, 2013. The Ministry returned the file to submit the same after getting it approved by Hon'ble Minister (E&F). The file was then submitted to MoE,F&CC for necessary action in this regard which is under consideration in the Ministry of Environment, Forest and Climate Change.”

OBSERVATIONS / RECOMMENDATIONS

STATUS OF INDIA'S GROUND WATER RESOURCES

1. The Committee note that India is endowed with a rich and vast diversity of natural resources, water being the most precious of them. In our country, ground water is a common-pool resource (CPR), used by millions of farmers. It also remains the only drinking water source in most of our rural households; besides, many industries depend upon ground water. The Committee also note that over the last four decades, around 84% of the total addition to the net irrigated area has come from ground water. Further, India is by far the largest and fastest growing consumer of ground water in the world. However, what is distressing is that ground water is being exploited beyond sustainable levels with an estimated 30 million ground water structures in play. The Committee are gravely concerned that the country is on the path towards a serious water crisis in the near future due to over-extraction and quality deterioration of ground water. The Committee also note with a sense of alarm that despite the fact that around 84% of the total addition to the net irrigated area in the country has come from ground water resources, the concerned Ministry/Department have not shown any interest in adoption of latest technology in this vital area and as such it has so far remained largely neglected. In view of the foregoing, the Committee would, therefore, strongly recommend that the specific steps be taken by the Central Government / States / UTs and concerned agencies in regard to adoption of modern technology for judicious, efficient management, utilization and development of ground water resources (States/UTs wise) in the country within a year after the presentation of this Report.

The Committee would categorically like to be apprised of the concrete action taken in this direction.

DATABASE ON NATURAL AND ARTIFICIAL RECHARGE OF WATER IN INDIA

2. As per the latest available assessment carried out by the Central Ground Water Board in the year 2011, the total annual replenishable ground water resources and the net ground water availability are 433 Billion Cubic Metres (BCM) and 398 (BCM), respectively. Out of the net annual ground water availability of 398 BCM, the total annual ground water draft in the country is 245 BCM and the overall stage of the ground water development has reached 62% of the net ground water availability. The Committee also note that the annual natural recharge to ground water (as in 2011) is around 433 BCM, which includes recharge from rainfall, tanks, ponds, Minor Irrigation structures, surface water bodies, irrigation seepage, etc., while the artificial recharge to ground water is being taken up by various Central / State Government Department / NGOs, individuals, etc. In this regard, the Committee are surprised to note that the latest assessment of replenishable ground water resources was undertaken by the Central Ground Water Board of the Ministry of Water Resources, River Development & Ganga Rejuvenation way back in 2011, which reveals that no serious and systematic efforts have been made by the Government towards development, management, conservation and related issues such shortages, scarcity, depletion and pollution of ground water, in spite of the alarming trend towards ground water problems in both quantitative and qualitative terms. The Committee are also dismayed to note the Ministry's reply that no single agency is maintaining the database on quantum of artificial recharge to ground water. The Committee, therefore, will like to underline the urgent need on the part of the Ministry of Water Resources, River

Development & Ganga Rejuvenation / Central Ground Water Board to undertake assessment of replenishable ground water resources on a regular basis, preferably after two years, starting from this year. Further, noting that the absence of a single agency in maintaining the database on quantum of artificial recharge to ground water is a serious lacuna in the efforts towards conservation, development and management of ground water resources and tackling related issues such as its over-exploitation, depletion and pollution, etc., the Committee recommend that the Ministry prepare a roadmap for creating a single agency to maintain database on the quantum of natural and artificial recharge to ground water and also on the quantum of ground water being utilized by various stakeholders, including farmers, industries and domestic sectors. The Committee may be apprised of the steps taken by the Government in this regard.

IMPACT STUDY OF DARK BLOCKS ON AGRICULTURE, ECONOMY, HEALTH & ENVIRONMENT:

3. The Committee observe that the number of Dark Blocks (Over-exploited assessment units) in the country as per assessment made in 2011 was 1071. The figure for Dark Blocks in 2009 was 802. The Committee note the Ministry's reply that indiscriminate withdrawal of ground water for irrigation, industries and domestic purposes had led to over-exploitation of ground water in 1071 units. They also note in particular that while there are 1071 Dark Blocks a covering a total area of about 5 lakh square kms., information on land use in Dark Blocks is not readily available. The Committee note with concern that agricultural land comprises a vast chunk of area which forms the source of livelihood for millions of farmers. They, therefore, desire that the Ministry / Central Ground Water Board initiate urgent steps to assess the areas in proportion of agricultural land in India falling under Dark Blocks and apprise them

accordingly. The Committee further note the Ministry's reply that no study has been undertaken by the Central Ground Water Board regarding the losses caused to agriculture, economy, health and environment due to the Dark Blocks and they, therefore, recommend that a study in this regard should also be initiated by the Ministry / Central Ground Water Board within six months of the presentation of this Report and the Committee be apprised about the details of the study.

GROUND WATER SCENARIO

4. The Committee note that the Ministry of Agriculture had informed them that the reason for over-exploitation in the North-Western part of India i.e. Punjab and Haryana, is indiscriminate extraction of ground water, mainly for irrigation purposes. In the Western part of the country, i.e. Rajasthan and Gujarat, over-exploitation is caused by arid climate, resulting in scanty and irregular rainfall and consequent less discharge, while in the Southern part, i.e. Karnataka and Tamil Nadu, the large number of over-exploited blocks are caused because of the hard rock terrain which permits less recharge, resulting in water stressed conditions. The Committee also note with concern the reply of the Ministry of Water Resources, River Development & Ganga Rejuvenation that the situation regarding ground water scenario is aggravating in Punjab, Haryana and Rajasthan because of the unsuitable cropping pattern, i.e. the paddy that is grown in Punjab and Haryana uses up a large quantum of water. They also note the suggestion of the Ministry to improve the distressing ground water scenario in Punjab, Haryana and Rajasthan, viz.

(i) On-Farm Water Management techniques such as Laser Levelling, Zero Tillage, use of Tensiometer in Paddy cultivation, adoption of improved irrigation methods, adoption of micro irrigation (sprinkler & drip), mulching for reduction of evaporation losses, timely

transplanting of paddy, conjunctive use of canal and ground water etc.; (ii) implementation of a conceptual document entitled 'Master Plan for Artificial Recharge to Ground Water' by the States concerned; and (iii) revamping agricultural power supply and pricing structure, in view of the fact that the use of flat rates or free electricity, combined with unreliable supplies, tends to adversely affect the use of ground water. The Committee, therefore, recommend that (i) the Ministry immediately take follow-up action with the State Governments of Punjab, Haryana and Rajasthan and provide them technical know-how to adopt and implement the requisite water management techniques as outlined above. They also recommend that three States may also be encouraged to implement the 'Master Plan for Artificial Recharge to Ground Water' which has already been circulated to them for effective implementation. Further, acknowledging that the free supply of electricity to farmers at times indirectly encourages wasteful draft of ground water, the Committee recommend that the States concerned may be prevailed upon to undertake an exercise for revamping the agricultural power supply and pricing structure for implementation to curb wasteful and excessive withdrawal of water by the irrigation sector.

IMPACT OF PADDY CULTIVATION ON GROUND WATER IN PUNJAB, HARYANA & RAJASTHAN

5. The Committee further note that as per the latest assessment year 2011, ground water withdrawal for irrigation purpose accounts for 97.96% in the Punjab, 94.58% in Haryana and 88.47% in Rajasthan. The Committee note from the reply of the Ministry that no specific study has been conducted by the Central Ground Water Board so far on the problem of excessive withdrawal of groundwater due to paddy cultivation in these States. In view of the grim ground water scenario prevailing in the three States, the Committee

strongly recommend that the Ministry should set up a study group comprising experts, professionals, officials drawn from their own Ministry / Central Ground Water Board, Ministry of Agriculture, State Governments of Punjab, Haryana and Rajasthan and reputed institutions to make a scientific assessment of the impact of excessive withdrawal of ground water due to paddy cultivation in the States of Punjab, Haryana and Rajasthan and to come out with remedial measures to curtail water draft without compromising on the output of paddy in these States and apprise the Committee accordingly.

GROUND WATER WITHDRAWAL BY THE IRRIGATION SECTOR

6. The Committee note that (as on March, 2011), the annual ground water withdrawal for domestic and industrial purpose was 22.71 BCM, which constituted only 9.26% of the total ground water withdrawal. In contrast to this, the ground water withdrawal for irrigation purposes reached the staggering level of 222.36 BCM or 90.75% of the total ground water withdrawal in the country. This, no doubt, underlines the grim reality that the prime cause for the declining ground water level in the country has been the withdrawal of ground water by the irrigation sector. The Committee are of the view that one of the factors responsible for this scenario has been the absence of clear-cut policy guidelines on ground water draft / extraction till now. The Committee, therefore, desire that the Government should come out with a well-defined policy on ground water extraction for ensuring long-term sustainability of the depleting ground water resources at the earliest. They also believe that free supply of electricity to farmers may tend to encourage wasteful draft of ground water, and hence, it should be regulated with proper accountability by the States where such schemes exist. Also, arrangements should be put in place for a proper time separation for pump operation for the farmers as well as the

general public. In addition, in areas where farmers have developed their own resources for extraction of ground water, such an operation may also be regulated by the authorities concerned, and where there is Government infrastructure in this regard, private initiatives should be discouraged or banned. The Committee desire the Government to initiate steps in conjunction with the State Governments and authorities / agencies concerned to ensure compliance of the aforesaid recommendations and apprise them accordingly.

ENFORCEMENT OF DIRECTIONS / NOCs ISSUED BY THE CENTRAL GROUND WATER AUTHORITY

7. According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, the Central Ground Water Authority (CGWA) has notified 162 areas (District/Blocks/Mandals//Talukas/Municipal areas) in the country for regulation of ground water development and management. In these notified areas, installation of new ground water structure is not permitted without prior specific approval of authorized officers. The Committee also note that altogether 133 complaints have been received from the notified areas for violation of directions of the CGWA. Advisory Committees under the Chairmanship of District Collector / Deputy Commissioner with members drawn from various organizations have been constituted and illegal wells have been sealed and action being taken by the authorized officers under the Environment (Protection) Act, 1986. In non-notified areas, the Central Ground Water Authority accords 'No Objection Certificate' (NOC) for the withdrawal of ground water to new projects and also for the expansion of industrial / infrastructure mining - projects with the condition to adopt artificial recharge measures, mandatory recycling and reuse of water. Further, the CGWA has informed all State Pollution Control Boards to set up monitoring mechanism to verify requirement and actual withdrawal of ground water, including implementation of artificial recharge measures

by industries/projects. In addition, random inspections by the Central Ground Water Board are carried out to check that the industries/projects using ground water are complying with the conditions laid down in the NOC granted to them. The Committee are, however, constrained to note that no timeline for inspection is fixed at present, but such inspections are ordered / directed only upon receipt of complaints of violations. The Committee desire that a system of regular inspections should be instituted in respect of industries / projects to whom NOC has been issued by the CGWA to ensure compliance of conditions mentioned in the NOC in addition to the system of random inspection already in place. The Committee also desire that the CGWA vigorously pursue with all State Pollution Control Boards (SPCBs) to ensure that an appropriate, effective monitoring mechanism is set up by them to verify the requirement and actual withdrawal of ground water, including implementation of artificial recharge measures by industries/projects. Further, stringent action may be taken against non-complying industries/projects and they be booked under the provisions of the Environment (Protection) Act, 1986. The Committee also desire that mandatory annual review of the status of implementation of the regulatory directions issued by the CGWA may be carried out by the Government to ensure the effective compliance by the State Governments/ implementing authorities.

DEMONSTRATIVE PROJECTS FOR RAIN WATER HARVESTING & ARTIFICIAL RECHARGE TO GROUND WATER

8. According to the Ministry of Water Resources, River Development & Ganga Rejuvenation, the CGWB has undertaken Demonstrative Rainwater Harvesting and Artificial Recharge projects in priority areas such as 'Over-exploited' (Dark Blocks) and 'Critical' Assessments Units during the 11th Plan under the scheme of 'Ground Water Management & Regulation'. A total of 1661 structures were approved and 1389 structures

completed at a total approved cost of Rs. 9987.447 lakh, out of which Rs. 8971.46 lakh have been released to 22 States as on 31.01.2015. The Committee note that the Demonstrative Projects for Rainwater Harvesting and Artificial Recharge to ground water during the 8th, 9th and 10th Plan periods resulted in the annual ground water recharge of 4.0 Million Cubic Meter (MCM), 45.0 MCM and 2.14 MCM, respectively, while the anticipated recharge from the Demonstrative Artificial Recharge project implemented during the 11th Plan was likely to be 55.20 MCM. The Committee are unhappy to note that in spite of the substantial benefits brought by the Demonstrative Projects for Rainwater Harvesting and Artificial Recharge projects, the scheme was closed on 31.03.2012. The Committee are further perturbed that there is no separate scheme for artificial recharge to ground water or contamination of ground water during the 12th Plan, which displays the lack of commitment towards promoting artificial recharge and Rainwater Harvesting in the Dark Blocks and 'Critical' Assessment units. The Committee, therefore, recommend that the Demonstrative Projects for Rainwater Harvesting and Artificial Recharge projects in the Dark Blocks and 'Critical' assessment units should be renewed during the 12th Plan with additional financial allocation. They also desire to be apprised about the actual achievement (physical and financial) made under the Scheme during the 11th Plan for the entire country. Further, the Committee also feel in this regard, there is a need for ensuring proper functioning of tube-wells and dug-wells. They, therefore, desire that steps be taken for sealing of dug-wells which are defunct and are not in use, since they serve as dustbins in the villages / paddy fields and are a major source of ground water contamination. Regarding tube-wells, the Committee are aware that in several villages, tube-wells for the drinking water supply have been installed on this agricultural land,

which face the risk of contamination given the fact that pesticides are being extensively used for cultivation across the country. The Committee also feel that steps should be taken to ensure proper spacing between tube-wells in general to ensure there is perennial water in the tube-wells located in different parts of the country. As for the urban areas, given the fact that the existence of concrete structures and roads do not allow the water to percolate to the ground, ponds should be mandatorily set up in every urban locality, and urban local bodies should be specifically asked to strictly monitor the Rain Water storage and recharge to ground water. Additionally, in the coastal areas, steps be taken to prevent the encroachment of saline water into fresh water pockets, and saline water zones need to be sealed - wherever such encroachments have occurred. The Committee also desire that the periodic aquifer - mapping be carried out in India's coastal areas for assessment of the levels of saline encroachments.

ENFORCEMENT OF DIRECTIONS ON RAINWATER HARVESTING/ARTIFICIAL RECHARGE TO GROUND WATER

9. The Committee note that directions had been issued on 08.10.2009 to all the Residential Group Housing Societies / Institutions / Schools / Hotels / Industrial Establishments falling in the over-exploited and critical areas (except in waterlogged areas) in the country to adopt Rooftop Rainwater Harvesting System in their premises and also for implementation of ground water recharge measures along all National Highways / State Highways and other major roads by the CRRI, National Highways Authority of India, CPWD, State PWDs; along rail tracks by the Indian Railways; in the Stadia by the Sports Authority of India, BCCI and Departments of Sports and Youth Affairs; and in the Airports by the Airport Authority of India, Ministry of Civil Aviation, for Promoting Rain Water Harvesting/ adoption of Artificial Recharge to Ground Water (except in the water-logged

areas). Further, the CGWA had issued directions vide letter dated 08.08.2006 to the Chief Secretaries of 12 States and Administrators in Union Territories having over-exploited blocks to take necessary measures to promote/adopt artificial recharge to ground water/rain water harvesting. However, despite these regulatory measures, not much has happened by way of improvement. To cite an example, the Committee note that there were wastages of water from five star hotels in Delhi. They also note that the Hon'ble National Green Tribunal (NGT) had issued bailable warrants against 12 hospitals in Delhi for not installing Rainwater Harvesting in their hospital premises, which have been recalled upon application by the hospitals concerned. Noting that an MoU has been signed by the Government of NCT of Delhi with 33 Hotels for completion of installation of Rain Water Harvesting System, installation of STPs (Sewage Treatment Plants), Solar Water Heating System, Organic Waste Converter and Re-use of treated effluent leading to Zero discharge, and that, all these 33 Hotels have installed Rain Water Harvesting structures and also installed STPs to treat and re-use the waste water, and also that the hotels have also been asked to obtain permission from the Delhi Jal Board (DJB) for ground water extraction, the Committee urge the Government to ensure that these Hotels do not extract water without obtaining prior permission of the DJB in the NCT of Delhi. The Ministry has informed that a Committee consisting of officials from the Department of Environment, Delhi Pollution Control Committee (DPCC), academicians of IIT and Jamia Millia Islamia University had been reviewing the progress of compliance by these hotels from time to time relating to Green Hotels Guidelines. The Committee would like to be apprised of the outcome of the review/evaluation work being done by the said Committee after completion of the exercise. They also desire the Government to ensure that the 12

hospitals in Delhi duly install rain water harvesting structures in their premises. The Committee would further desire that the Government take new initiatives to promote re-use of recycled water in every city / town of the country, and would further like to be apprised of action taken in the matter by the Government.

MASTER PLAN FOR ARTIFICIAL RECHARGE TO GROUND WATER

10. The Committee were apprised that a conceptual document titled 'Master Plan for Artificial Recharge to Ground Water to India' prepared by the Central Ground Water Board in 2013 was circulated to all State Governments incorporating (i) identification of suitable areas for artificial recharge; (ii) estimation of sub-surface storage space availability; (iii) quantification of local surplus annual run-off availability as source water for artificial recharge; and (iv) recommending number and types of structures required along with their estimated costs, and which also provides district-wise number of feasible artificial recharge structures along with their estimated costs. The total area identified for artificial recharge in the country is nearly 9.4 lakh sq.km., while the total estimated volume of water to be recharged is 85.6 BCM. However, regrettably, only 6 State/UT Governments have taken follow-up action on the Master Plan, viz. Gujarat, Madhya Pradesh, Rajasthan, Uttar Pradesh, West Bengal and Andaman & Nicobar Islands. Noting that no review has been done regarding implementation of the Master Plan, the Committee desire that the Government take proactive and concerted efforts to encourage all the States/UTs to take follow-up action on the 'Master Plan for Artificial Recharge to Ground Water in India', and also undertake a comprehensive review of follow-up action taken by States/UTs in this regard during 2014-15 positively. The Committee also note that the Master Plan envisaged construction of different types of Artificial Recharge and Rain Water Harvesting

structures in an area of 91541 sq. km. by harnessing surplus Monsoon run-off to augment ground water resources. The Ministry have informed the Committee in this regard that during the 12th Plan, the CGWB has taken up the Aquifer Mapping and Management Programme, wherein aquifer-wise ground water resources and quality is to be assessed in priority areas covering 8.89 lakh sq. km. which include water stressed ('Over-exploited' areas) and quality vulnerable areas. Rs. 2051 crore have been allocated for the Aquifer Mapping and Management Plan during the 12th Plan as per the Ministry of Water Resources, River Development & Ganga Rejuvenation. The Committee recommend that the Ministry take necessary steps for judicious utilization of Rs. 2051 crore allocated towards Aquifer Mapping and Management Plan during the 12th Plan by implementing a time-bound roadmap to achieve its objective, i.e. assessing aquifer-wise ground water resources and quality in priority areas covering 8.89 lakh sq. km. in the country. The Committee desire to be informed of the steps taken by the Ministry as also the achievements (physical and financial) made during the 12th Plan so far under the Aquifer Mapping and Management Plan.

ENACTMENT OF MODEL BILL TO REGULATE AND CONTROL THE DEVELOPMENT OF GROUND WATER BY STATES/UTs

11. The Committee note that the Government had circulated a Model Bill to regulate and control the development of ground water to all States/UTs as far as in 1970 to enact suitable legislation, which was recirculated in 1992, 1996 and revised and recirculated again on 28.02.2005, incorporating a new chapter on Rainwater Harvesting for recharge to ground water. The Model Bill stipulates (i) establishing of State Ground Water Authorities to frame policies for administration of the legislation; (ii) empowering the State / Union Territory Government to control and / or regulate the abstraction of ground water; and (iii)

requiring users of ground water to seek permission from the State Ground Water Authority to sink a well in the notified area. Regarding the implementation of the Model Bill, the Committee were apprised that 15 States/UTs have so far enacted necessary legislation on the Model Bill, another 15 States/UTs have taken initiatives for enactment of the Model Bill, while another 5 States of the North-east region, i.e. Arunachal Pradesh, Manipur, Nagaland, Sikkim and Tripura do not feel the need for enactment of such legislation. In this connection, the Committee further note that the Supreme Court, while reviewing the Model Bill circulated by the Government in 1970 to the States/Union Territories, had directed the National Environmental Engineering Research Institute (NEERI) in 1996 to examine and submit a report in this regard. They further note that a report from NEERI has since been received which, among others, included (i) regulation on exploitation through legislation and effective administration with focus on water conservation, recycle-reuse, restrictions to ensure equitability in water availability and pragmatic land use; and (ii) regulation by education, i.e. by creating awareness amongst the people to enable their participation and traditional knowledge in sustainable water resource management. The Committee urge the Government to initiate specific action for implementation of the recommendations of NEERI under the framework of the existing constitutional provisions with six months of the presentation of this Report and apprise the Committee accordingly. The Committee will also like the Ministry to pursue with all the States/UTs and especially those 15 States/UTs which have taken initiatives for enactment of Model Bill so that concrete results are achieved in this regard. The Committee further note that for regulation of supply of water and use of water, the ground water regulations have been implemented by various other countries which include

Ground Water Rule (of) United States Environmental Protection Agency (2006), California Water Code, Ground Water Management (2014), Oregon Ground Water Quality Protection Act, USA (1989), British Columbia, Canada (2001) Water Resources Act, UK (1991), Water Act, UK (2003), and European Committee Environmental Objectives (Ground water) Regulations, Ireland (2010). They desire that if need be a review of the adequacy or otherwise of the provisions of the Model Bill be also undertaken keeping in view the provisions made under the various Acts/regulations as stated above, in different countries of the world, within a definite time-frame to ensure that no loophole is left in the Model Bill for regulating ground water laws in various States/UTs in the country.

SATELLITE APPLICATION CENTRES FOR WATER CONSERVATION PLANNING

12. The Committee observe that for strengthening the Satellite Application Centres (SACs) in 8 States, namely Maharashtra, Karnataka, Kerala, Chhattisgarh, Andhra Pradesh, Haryana, West Bengal and Assam to assist MGNREGA functionaries in better planning of water conservation structures, a pilot scheme has been initiated with Indore district, Madhya Pradesh, as the first of its kind, which is yet to take off. The Committee trust that this Pilot project in Indore district will be completed expeditiously, thereby setting the pace for similar projects to be worked out with the other remaining 7 States. They will also like the Government to pursue with the State Governments concerned to submit proposals for funding the project so that the SACs are strengthened to effectively assist the MGNREGA functionaries for better planning of water conservation structures. The Committee further desire that, given the fact that different districts of Odisha have suffered severe drought in the recent years, accordingly steps be taken to include Odisha

among the States - where SACs are being strengthened for water conservation planning in the country. The Committee would like to be informed of action taken in the matter.

GROUND WATER OBSERVATION WELLS

13. The Committee note with concern that the ground water monitoring data of the Central Ground Water Board for Pre-Monsoon 2014, compared with the decadal mean of Pre-Monsoon (2004-2013), indicates that out of the total wells analysed, around 39% wells are showing decline in ground water levels as observed in parts of Andhra Pradesh, Assam, Chhattisgarh, Daman & Diu, Delhi, Gujarat, Haryana, Karnataka, Kerala, Punjab, Rajasthan, Tamil Nadu and West Bengal. However, as per ground water level data, the situation cannot be termed as drought-like situation. They also note that the 'Dark (Over-exploited) Blocks' covering 1071 assessment units, i.e. 16.21% of the total units, hold implications such as significant decline in ground water levels, critical (water) position/situation in the Northern States, drying up of wells, deterioration in ground water quality, increasing energy consumption for lifting water, and need to regulate extraction, development and management of ground water. The Committee, therefore, note with concern that a very grim future awaits large parts of the country on the water front. They further note that the Central Ground Water Board carries out ground water monitoring four times a year on regional scale through a network of observation wells, which increased in number from 15653 to 20698 across the country during the period from March 2012-13 to March, 2014. However, while appreciating the increase in absolute numbers of ground water observation wells, the Committee are disturbed to find that the number of observation wells has shown decrease in respect of several States/UTs, viz. Andhra Pradesh (from 982 to 879), Delhi (from 162 to 120), Karnataka (from 1507 to 1273),

Rajasthan (from 1118 to 1111), and Chandigarh (from 28 to 25) during the same period. The Committee desire to be apprised of the reasons for the fall the number of ground water observation wells in these States/UTs. They also note that ground water level data has been collected from all the States except for Mizoram, Sikkim and UT of Lakshadweep where water level monitoring is not being carried out. The Committee will like to know the reasons for not undertaking water level monitoring in the States of Mizoram, Sikkim and UT of Lakshadweep and also urge the Ministry to initiate corrective steps in this regard and apprise them accordingly.

SYNERGY BETWEEN MGNREGA AND GROUND WATER MANAGEMENT

14. The Committee note that expenditures on water conservation and water harvesting and renovation of traditional water bodies constitute 15.1% and 29.4%, respectively of the total expenditure on the Mahatma Gandhi National Rural Employment Guarantee Act, 2015. As per a study conducted by the Indian Institute of Science, Bengaluru, and GIZ across 5 States, viz. Rajasthan (Bhilwara), Madhya Pradesh (Dhar), Andhra Pradesh (Medak), Karnataka (Chitradurga) and Sikkim (South District), the MGNREGA had a positive impact on the environment, which also include rise in water availability and area irrigated, improvement in soil quality, improvement in ground water levels, increase in area under crop production and reduction in soil erosion. The Committee are fully convinced that works undertaken under MGNREGA, including creation of water conservation and water harvesting structures to augment and improve ground water like dykes, earthen dams, stop dams, check dams, etc., will go a long way in recharging and stabilizing ground water, including drinking water source, and they, therefore, recommend that concerted efforts be launched by the Government to achieve optimized returns on

works undertaken under the MGNREGA scheme, in respect of ground water augmentation and related works all over the country. The Committee also desire that appropriate steps be initiated to achieve synergy among various Ministries concerned, i.e. Water Resources, River Development and Ganga Rejuvenation, Environment, Forests & Climate Change, Agriculture, Drinking Water & Sanitation, and Rural Development in delivering optimized results under the MGNREGA scheme in both rural and urban areas, specially on the works related to ground water conservation. To achieve this goal, they urge the Ministry to set up a special coordination cell dedicated to achieve the goal of synergy among the Ministries concerned which will coordinate information flow among these Ministries and with the States on MGNREGA works related to ground water / water harvesting. The Committee further desire that the Ministry keep a strict watch on the execution of these MGNREGA works, including fund utilization to check misuse and under-utilization of funds meant for those purposes. The Committee will like to be apprised of action taken in this regard.

NEW URBAN REJUVENATION MISSION

15. According to the Ministry of Urban Development, revision of building by-laws for mandatory Rainwater Harvesting in all buildings has been implemented / enacted in 60 cities across 29 States/UTs, viz. Andhra Pradesh (4), Arunachal Pradesh (1), Assam (1), Bihar (2), Chandigarh (1), Chhattisgarh (1), Goa (1), Gujarat (4), Haryana (1), Himachal Pradesh (1), Jammu & Kashmir (2), Jharkhand (1), Kerala (2), Karnataka (2), Madhya Pradesh (4), Maharashtra (5), Manipur (1), Meghalaya (1), Mizoram (1), Puducherry (1), Punjab (2), Odisha (2), Rajasthan (2), Tamil Nadu (3), Tripura (1), Uttarakhand (3), Uttar Pradesh (7), and West Bengal (2). They have also informed that by-laws on re-use of

recycled water have been implemented/enacted in 61 cities across 30 States/UTs. In this connection, the Committee note that the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) had ended on 31.03.2014 and a new Urban Rejuvenation Mission is under consideration of the Ministry for which the guidelines are being finalized. The Committee will like the Ministry to expeditiously launch the new Urban Rejuvenation Mission and work on it in a time-bound manner, and apprise them accordingly.

CENSUS AND INVENTORIZAZION OF WATER BODIES AND INSTALLATION OF WATER METERS ON TUBEWELLS

16. The Committee note that as per the 4th Minor Irrigation Census (2006-07), the total number of water bodies used for Minor Irrigation in the country was 523816, of which the number of water bodies in-use and not in-use are 443688 and 80128, respectively. The Committee were informed that the data on the number of ponds is not available separately. The Committee also note the reply of the Ministry that inventorization of water bodies is feasible and in order to collect the detail of water bodies, the Ministry of Water Resources, River Development & Ganga Rejuvenation has planned to undertake census of all water bodies in the country. Noting the importance of water bodies for their potential to recharge ground water resources, the Committee recommend the Ministry to initiate urgent steps to complete inventorization of water bodies and also complete the exercise of undertaking census of water bodies, being planned by the Ministry, within a definite time-frame. The Committee are surprised to find that even the data on number of ponds is not available separately with the Ministry, and they desire that a comprehensive assessment in this regard also is an imperative need to be made at the earliest. Further, the Committee are of the view that no programme / scheme has been initiated by either the Union or State Governments for desilting water bodies, which are in fact facing

encroachments from human settlements as well as plants/weeds, etc. The Committee, therefore, recommend that new initiatives in this regard be taken up by the Ministry for launching special programme for upkeep, maintenance and restoration of water bodies, especially in those areas which fall under the Dark Blocks, with sufficient budgetary allocation for its proper implementation. Further, steps should be taken so that extraction of water from water bodies is limited only upto certain permissible level in order to guarantee the sustainable level of water bodies. The Committee further recommends strong measures need to be taken by the Government to undertake survey of the water bodies encroached upon all over the country and steps be initiated for removal of all encroachment therefrom. Noting that the extraction of ground water has not been regulated effectively which has led to serious decline in the ground water levels in many parts of the country, the Committee also desire that to restrain unnecessary use of ground water for irrigation and drinking purposes, installation of water meters should be made mandatory on the principle of 'Beneficiary Pays' in all tube-wells across the country. In the Dark Blocks, special irrigation functional schemes should be introduced and farmers should be incentivized to grow more water efficient crops and adopt water efficient irrigation techniques like drip irrigation, sprinkler irrigation, etc. to reduce water consumption in agriculture and people should also be encouraged to adopt and apply water efficient technologies and re-use of waste water.

INTENSIFICATION OF EFFORTS REGARDING AWARENESS PROGRAMME

17. The Committee are happy to note that the Ministry of Water Resources, River Development and Ganga Rejuvenation had organized three events under the 'India Water Week' during 2012, 2013 and 2015 at an approximate total expenditure of Rs. 8.42 crore to resolve water related issues and create awareness on ground water. The Committee also note the Ministry's reply that organisation of 'India Water Week' provides a forum for

interaction with stakeholders, policy makers, professionals, managers, academicians, etc., from States and various foreign countries and helps in having better understanding of the issues pertaining to water, identifying the most rational approach to water development and management and projecting know-how available in the country. Acknowledging that public participation and social awareness among the masses is a pre-requisite for the success of any initiative taken for addressing the problems associated with ground water depletion and pollution, the Committee are encouraged to observe that academicians, students and urban local bodies are already involved in India Water Week and that during the oneday workshop on 'Hamara Jal – Hamara Jeewan' organized in various districts, representatives from NGOs/WALMIS (Water and Land Management Institutes) /Panchayati Raj Institutions / Departments of Agricultural /Horticulture/Watershed Development/PRD/PHED working in the districts were included as members of the organizing committee. The Committee hope that the Ministry will continue its endeavour for organizing mass awareness programmes with participation of all stakeholders and various sections of the community. They also note that given the fact that the overall stage of ground water development has reached 62% of net ground water availability, focused efforts be made towards highlighting the issues related to ground water depletion and pollution. The Committee, therefore, recommend that the Ministry evolve concrete measures to give ground water related issues more importance in all activities organized during such water awareness programmes. They also desire that the 'India Water Week' of the Ministry be synchronously organized on a permanent, annual basis at all State capitals as well, so that the impact of the programme permeate. Additionally, elected representatives at the Panchayat level, such as Sarpanch, village ward members, etc. and Corporators in urban local bodies may be trained about the basics of ground water, its withdrawal effects, reasons for contamination, health hazard

effects, etc. along with the need for taking remedial measures - in order to make the villagers and other beneficiaries aware in this regard.

FOLLOW-UP ACTION ON INDIA WATER WEEK

18. The Committee also observe that several notable outcomes/recommendations have emerged from the India Water Week events of 2012, 2013 and 2015. These include, among others, (i) need for adoption of water ethics in policies and practices for planning and management of water resources; (ii) need for scientific assessment of environmental and ecological needs of the river and creation of adequate storage needs to augment the flow during lean season; (iii) need for judicious deployment of all measures for utilization of ground water as well as surface water in order to ensure their sustainability; (iv) need to frame policy and to design monitoring network based on available tools and technology for ensuring effective and extensive monitoring of water quality as also of waste water quality; (v) need to treat waste water as resource and need to develop business model involving local entrepreneurship for making sewage treatment process a profitable proposition rather than a welfare work; and (vi) stress on participation of stakeholders in water management, i.e. 'Jan Andolan'. The Committee ardently hope and expect that the Ministry will initiate efforts to concretize these findings/recommendations which emerged during the three India Water Week events in 2012, 2013 and 2015 and apprise the Committee accordingly. They also desire that the area specific factors of ground water depletion be publicized regularly in the print and electronic media especially in the States falling under the Dark Blocks, and useful devices/techniques to avoid ground water depletion and adoption of conservative measures such as Rainwater Harvesting/Artificial Recharge to ground water be highlighted regularly and widely to the people.

'WATER' UNDER CONCURRENT LIST OF CONSTITUTION

19. The Committee note the reply of the Ministry that the proposal to bring 'Water' in the Concurrent List of the Constitution has been opposed by most of the States and the proposal did not find favour with the two Commissions on Centre-State relations chaired by Justice R.S. Sarkaria (1983-88) and Justice M.M. Punchhi (2007-10). However, the Committee believe that the subject of water needs to be dealt within a consultative manner, taking into consideration the overall national perspective, given the fact that the country will be facing acute water crisis in the near future especially on the ground water front. In view of the need to adopt a holistic approach for tackling the problem in a comprehensive and equitable manner, the Committee, therefore, reiterate their earlier recommendation contained in the 10th Report and 16th Report (15th Lok Sabha) and 4th Report (16th Lok Sabha) and urge the Government to initiate earnest efforts to build national consensus to bring the subject of 'Water' in the Concurrent List of the Constitution after undertaking necessary consultations with the States with a view to evolving a comprehensive national plan of action for better conservation, development, and management of water, including ground water.

NATIONAL PERSPECTIVE PLAN ON GROUND WATER

20. The Committee note that based on the criteria suggested by the Ground Water Resources Estimation Committee (GEC-1997), assessment of ground water resources have been made and categorized under different assessment units. Accordingly, 1071 assessment units have been identified as 'Dark' (over-exploited) blocks, 217 as 'Critical' blocks and 697 'Semi-critical' blocks in 2011. According to the Ministry, the number of Dark (over-exploited) blocks has witnessed an increase of 765 in 2011 as compared with

2009. The Committee also note that vagaries of Monsoon rainfall resulting into reduced rainfall and exploitation of ground water for irrigation, domestic and industrial purposes in a proportion more than the rainfall recharge are the main factors that have resulted in depletion of ground water. The Committee are fully convinced that the ground water scenario is heading towards a potential crisis in the future and that necessary corrective measures need to be undertaken by the Centre, State, Local governments/bodies and all stakeholders, viz. villagers, urban dwellers, farmers, industrialists, Water Users Associations (WUAs), etc., without loss of further precious time. To begin with, the Committee are of the view that a national perspective plan needs to be evolved by the Government for efficient management, development and augmentation of the rapidly-depleting ground water resources, and they, therefore, desire that the Government expeditiously initiate steps for creation of a separate panel comprising experts, specialists and officials drawn from cross-sections of society to deliberate on and formulate the national perspective plan on ground water resources, which would prepare a roadmap for arresting the present declining trend of ground water and also work out a comprehensive strategy for meeting the increasing demands for ground water from the growing population in the decades to come. The Committee will like to be apprised of the action taken by the Government in this regard at the earliest.

TASK FORCE TO ASSESS STATUS OF GROUND WATER RESOURCES

21. The Committee note that the ground water quality is gradually but surely declining everywhere. They also note that a vast majority of ground water quality problems are caused by large scale concentrated pollution such as industrial discharges, landfills, sub-surface injection of chemicals and hazardous waste. In some other areas, elevated level

of Arsenic in ground water is caused by natural processes and also by application of fertilizers. According to the Central Pollution Control Board, a vast majority of ground water quality problems are caused by contamination, over-exploitation, or combination of the two. Ground water pollution is difficult to detect, and the contamination is not detected until obnoxious substances actually appear in water used, by which time the pollution has often dispersed over a large area. Noting further the statement of the Ministry of Drinking Water & Sanitation that nearly 85% of rural drinking water supply in the country is based on ground water and over-exploitation and subsequent ground water development is inducing more chemical contamination in aquifers, the Committee are convinced that concerted action is urgently required to be launched by the Ministry of Water Resources, River Development & Ganga Rejuvenation to reverse this highly alarming trend of ground water depletion / contamination. The Committee, therefore, recommend that the Ministry, in coordination with other allied Ministries such as Environment, Forests & Climate Change, Agriculture, Drinking Water & Sanitation, Rural Development & Urban Development may institute a task force to undertake detailed study / assessment of the health, productivity and status of ground water, including aquifers, and submit a report in the matter with recommendations within a time-frame to protect, augment and restore the underground water. The Committee will like to be apprised of action taken by the Government in this regard.

CONTAMINATION OF UNDERGROUND WATER BY POLLUTING INDUSTRIES IN DARK BLOCKS:

22. The Committee observe from the reply of the Central Pollution Control Board that industries responsible for ground water as well as surface water pollution fall broadly in the categories of slaughter houses, distilleries, pulp and paper, tanneries, textiles,

chemicals and dyeing industries. The CPCB had undertaken a comprehensive assessment of 88 industrially polluted areas in the country based on the Comprehensive Environmental Pollution Index (CEPI) out of which 43 industrial clusters in sixteen States have been classified as critically polluted areas (CPAs) with CEPI scores of 70 and above. So far, 3 rounds of environmental quality monitoring (Air, Surface Water, Ground water) have been undertaken by CPCB (2009, 2011 2013) at a total cost of Rs. 21.43 lakh, Rs. 78.34 lakh and Rs. 56.00 lakh during 2009, 2011 and 2013, respectively. The Ministry of Water Resources, River Development & Ganga Rejuvenation have also informed that directions have been issued by the CPCB to all the State Pollution Control Boards (SPCBs) of 43 CPAs for installation of Continuous Ambient Air Quality Monitoring Stations and Continuous Water Quality Monitoring Stations in each of the 43 CPAs. The Committee are of the firm opinion that there is a need to keep a strict vigil on polluting activities of industrial establishments in the 24 CPAs, especially those located in the Dark Blocks zones. The Committee, therefore, recommend that the Ministry in coordination with the Central Pollution Control Board of the Ministry of Environment, Forests & Climate Change, devise an effective mechanism to identify CPAs located in Dark Block areas and also to take steps to minimize and control the dumping of industrial waste into surface water as well as underground aquifers in these areas. Noting that comprehensive remedial action plan for the 43 identified critically polluted industrial clusters was prepared by SPCBs, the Committee would like the Ministry to strictly pursue with the CPCB/SPCBs for effective implementation of the comprehensive remedial action plan in order to reduce and minimize ground water pollution in the Dark Blocks zones. Further noting that three rounds of environmental quality monitoring have been carried out by the

CPCB through reputed environmental labs in 2009, 2011 and 2013, the Committee desire that such monitoring activity by the CPCB be undertaken on an annual basis in those 24 CPAs. The Committee also desire that the Ministry keep tab on CPCB to ensure that its directions to SPCBs concerned of the 43 CPAs regarding installation of Continuous Ambient Air Quality Monitoring Stations and Continuous Water Quality Monitoring Stations are duly complied with by the SPCBs. The Committee will like to be informed about further action taken in this regard.

IMPLEMENTATION OF 24X7 MONITORING DEVICES & ZERO LIQUID DISCHARGE BY INDUSTRIES

23. The Committee note that the CPCB has directed the SPCBs/ PCCs (Pollution Control Committees) to install 24x7 real time monitoring devices at effluent and emission discharge points in industrial units throughout the country. Out of 2800 industries to which such directions were issued, nearly 50 per cent of the industrial units have moved towards compliance. More than 920 industries have installed 24x7 monitoring devices and another 400 units have moved towards Zero Liquid Discharge (ZLD). Further, online monitoring data communication has been started by the industries to CPCB/SPCBs on the status of compliance with respect to effluents and emissions. The Committee also note that new industrial units in Distillery, Textile, Tannery, Chemicals, Fertilizers, Dyes and Pharmaceuticals have been mandated to achieve ZLD from the commissioning along with installation of 24x7 monitoring systems. The existing units in these sectors are required to switch over to ZLD in a time-bound manner and are required to install web-cameras instead of continuous effluent monitoring devices. The Committee desire that the CPCB's direction to SPCBs/PCCs regarding installation of 24x7 real time monitoring devices at effluent and emission discharge points in industrial units throughout the country be made

a mandatory requirement for all heavy and medium industries. They also desire that the CPCB strictly monitor the implementation of its directions to SPCBs/PCCs in this regard so that no scope is left for emitting or discharging contaminated / polluted air or waste water by the industries. The Committee also note that only 50% of the industrial units out of 2800 industries to which the directions have been issued by CPCB, have moved towards compliance and they desire that the remaining 50% of industrial units may also be prevailed upon by CPCB for compliance. The Committee further desire that all industrial units located in the Dark Blocks should be mandatorily required to install necessary devices for achieving ZLD (Zero Liquid Discharge) so that industrial wastes discharge to surface as well as ground water is kept at the bare minimum. Additionally, the Committee desire that all industries, especially those belonging to polluting categories such as slaughter houses, distilleries, pulp and paper, tanneries, textiles, chemicals and dyeing industries, be mandatorily required to treat their industrial waste through Common Effluent Treatment Plants (CETPs) and necessary steps may be initiated in this regard by CPCB at the earliest. The Committee will like to be apprised of further action taken in this regard.

WATER QUALITY AFFECTED HABITATIONS

24. The Committee note that the Ministry of Drinking Water & Sanitation have informed that as per online 'Integrated Management Information System' (IMIS), as on 18 May, 2015, States have reported 63,282 water quality-affected rural habitations (Arsenic -1482, Fluoride – 11309, Salinity – 16289, Iron – 32020, Nitrate – 2182) in the country. Further, as reported by the States on online IMIS of the Ministry, heavy / toxic metals have been found in nearly 8862 rural inhabitations, of which Punjab, Assam and West Bengal are the most

affected States in terms of occurrence of emerging contaminants in drinking water sources. In this connection, the Committee further note that excessive intake of fluoride and Arsenic in drinking water pose serious health hazards, especially in quality affected rural habitations. The Committee, therefore, desire that a concerted national programme be launched by the Ministry for the 63282 water quality affected rural habitations. They also desire that a new initiative may be taken up for those 8862 rural habitations which are facing contamination of heavy / toxic metals, especially for the States of Punjab, Assam and West Bengal, which are the most affected in terms of occurrence of emerging contaminants in drinking water sources. The Ministry of Drinking Water & Sanitation have advised all States to go in for surface water based, piped water supply (PWS) for providing safe drinking water in this water quality affected areas and these States have been advised to provide community water purification plants. The Committee are pleased to note that most State Governments have shifted their schemes towards surface water based piped water scheme, especially in water quality affected areas. The Committee are also happy to note that in Fluoride affected Karnataka, they have installed 1320 reverse osmosis (RO) plants whereas in the State of Punjab, 1876 RO plants have been installed for providing safe water for drinking and cooking purposes. The Committee, therefore, desire the Government to tackle the problem of drinking water in the rural areas on war footing and make all-out efforts for provision of piped water supply to maximum rural areas in the country, wherever feasible. The Committee further recommend to incentivize the worst affected States of Assam and West Bengal to go in for installation of RO plants as was done in Punjab and Karnataka. They also recommend that special steps be taken by the Ministry in coordination with the Ministry of Drinking Water & Sanitation to promote

community water purification plants in the water quality affected rural habitations all over country and desire to be apprised accordingly.

FLUORIDE AND ARSENIC CONTAMINATION IN WEST BENGAL

25. The Committee note the reply of the Ministry of Water Resources, River Development & Ganga Rejuvenation about the Fluoride contamination in Birbhum district and Arsenic contamination in Murshidabad district of West Bengal. They further note that among various measures taken by the Union Government and the State Government of West Bengal, in coordination with UNICEF, a Master Plan on fluoride mitigation in Birbhum district is under preparation and will be finalized on publication of the report of the Fluoride Task Force on technological option. The Committee hope that the said Master Plan will be finalized expeditiously and desire to be apprised of the details of the same after its finalization. The Committee also note that 47 exploratory wells had been constructed by the CGWB in Birbhum district, out of which 17 wells having fluoride-free water have been handed over to the State authority. The Committee will like the Ministry/CGWB to intensify its efforts in Birbhum district for construction of more fluoride-free exploratory wells in order to ameliorate the distress of people affected by fluoride contamination. The Committee further note that for tackling ground water contamination in the arsenic-affected blocks of Murshidabad district, the Government of West Bengal had constituted a Working Group comprising of eminent experts in the related fields from both the State and Union Government organizations as well as from academic institutions to examine and investigate into the matter. The Committee will like to be informed of the report of the Working Group in the matter. They also note that the CGWB, Kolkata, has carried out detailed ground water exploration in arsenic-affected

parts of Murshidabad district and 43 exploratory wells in 14 blocks have been constructed till March, 2014, out of which 22 arsenic-free exploratory wells have been handed over and accepted by the State Departments. Further, a collaborative project has been conducted by the CGWB with the United Nations Industrial Development Organisation (UNIDO) to explore the efficacy of the arsenic removal units in the arsenic-infected areas of West Bengal. The Committee, while appreciating such efforts, call upon both the Union and the State Governments to make all-out efforts to eliminate arsenic contamination of ground water in these areas of West Bengal. They also will like to be apprised of the outcome of the collaborative project conducted by the CGWB with UNIDO in this regard.

POLLUTION OF GROUND WATER IN GREATER NOIDA AND NCR

26. The Committee note the reply of the Ministry of Water Resources, River Development & Ganga Rejuvenation regarding the deteriorating ground water quality in Greater NOIDA, that as per the orders dated 14.05.2015 of the National Green Tribunal (NGT), the Uttar Pradesh Pollution Control Board (UPPCB) has filed a status report in NGT wherein violation by eight industries has been detected about 'No Objection Certificates' (NOC) issued by the CGWA in the Bisrakh Block of Greater NOIDA. They also note that the NGT has issued show cause notices returnable by 15.07.2015 as to why these industries should not be closed, and that further action shall be taken up on directions of the NGT after it has considered the replies from the eight industries at the next hearing on 15.07.2015. The Committee further note that as per ground water sampling carried out by the CGWB during 2013-14 in Chapraula Industrial Area, Bisrakh block, of Gautam Budhh Nagar district, heavy metals above permissible limits were reported in respect of iron (from all samples), aluminium (Roopvas), lead (Khera Chauganpur and Durai Taalpur) and

nickel (Khera Chauganpur). The Committee desire that early remedial steps be taken by the Ministry in coordination with the Ministries of Drinking Water & Sanitation, Environment, Forests & Climate Change to address the issue of contamination of ground water with heavy metals in Greater NOIDA and apprise the Committee accordingly. They also desire to be apprised of the further action taken by the Government in respect of the eight industries which violated the 'No Objection Certificate' (NOC) of CGWA while undertaking extraction of ground water in the Bisrakh Block of Greater NOIDA. Noting the serious situation arising out of the ground water contamination / pollution in many parts of the country, the Committee further recommend that the adverse impact of groundwater pollution in India be studied and documented in detail and corrective measures as warranted therein initiated by the Government. The Committee also recommend the Government to seriously consider constituting of a single, centralized agency at the earliest, which would be mandated to curb, control and eliminate ground water contamination / pollution in the country. The Committee would like to be apprised of the specific steps taken in this direction.

SYNERGY WITH NATIONAL GREEN TRIBUNAL AND WATER QUALITY ASSESSMENT AUTHORITY

27. Further noting that the National Green Tribunal (NGT) established on 18.10.2010 under the National Green Tribunal Act, 2010 is looking at resolving the issues related to ground water management, monitoring and conservation including ground water pollution / contamination with due regard to the provisions of the Environment (Protection) Act, 1986, with rules made thereunder and the Water (Prevention and Control of Pollution) Act, 1974 with rules made thereunder, the Committee desire that an effective synergy be devised by the Government to bring all complaints of ground water related issues to the

National Green Tribunal for getting immediate redressal. Additionally, the Water Quality Assessment Authority (WQAA) should be asked to prepare a roadmap for review/assessment and addressing the problem of ground water pollution in the country, and the Committee be apprised accordingly. The Committee further desire that WQAA be revamped and strengthened to meet the challenges of ground water quality problems. Side by side, steps may be taken to constitute branches of WQAA in each State/UT at the earliest. The Committee will like to be apprised of further action taken by the Government in this regard.

NEW DELHI
17 December, 2015
26 Agrahayana, 1937 (Saka)

HUKUM SINGH,
Chairperson,
Standing Committee on Water Resources

ANNEXURE - I

STATE/UT-WISE GROUND WATER RESOURCES AVAILABILITY (INCLUDING UTILIZATION AND STAGE OF DEVELOPMENT) IN INDIA
(as on 2011)

(in billion cubic meters)

| Sl.No. | Name of States / Union Territories | Annual Replenishable Ground Water Resource | Natural Discharge during non-monsoon season | Net Annual Ground Water Availability | Annual Ground Water Draft | | | Stage of Ground Water Development (%) |
|--------|------------------------------------|--|---|--------------------------------------|---------------------------|------------------------------|----------|---------------------------------------|
| | | | | | Irrigation | Domestic and industrial uses | Total | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | States | | | | | | | |
| 1 | Andhra Pradesh | 20.7892 | 1.9064 | 18.8828 | 6.2694 | 0.7381 | 7.0075 | 37 |
| 2 | Telangana | 15.098 | 1.4138 | 13.6844 | 6.9103 | 0.5919 | 7.502 | 55 |
| 3 | Arunachal Pradesh | 4.5100 | 0.4500 | 4.0600 | 0.0020 | 0.0010 | 0.0030 | 0.08 |
| 4 | Assam | 28.5200 | 2.7300 | 25.7900 | 2.8600 | 0.6400 | 3.4900 | 14 |
| 5 | Bihar | 29.3350 | 2.4705 | 26.8645 | 10.2550 | 1.6960 | 11.9509 | 44 |
| 6 | Chhattisgarh | 12.4200 | 0.7900 | 11.6300 | 3.4300 | 0.6200 | 4.0500 | 35 |
| 7 | Delhi | 0.3105 | 0.0234 | 0.2871 | 0.1402 | 0.2519 | 0.3922 | 137 |
| 8 | Goa | 0.2424 | 0.0970 | 0.1454 | 0.0101 | 0.0311 | 0.0411 | 28 |
| 9 | Gujarat | 18.5686 | 0.9832 | 17.5854 | 10.7477 | 1.1074 | 11.8551 | 67 |
| 10 | Haryana | 10.7800 | 0.9900 | 9.7900 | 12.3500 | 0.7100 | 13.0500 | 133 |
| 11 | Himachal Pradesh | 0.5590 | 0.0280 | 0.5311 | 0.2506 | 0.1272 | 0.3778 | 71 |
| 12 | Jammu & Kashmir | 4.2512 | 0.4251 | 3.8261 | 0.1988 | 0.6077 | 0.8065 | 21 |
| 13 | Jharkhand | 6.3100 | 0.5500 | 5.7600 | 1.3100 | 0.5500 | 1.8600 | 32 |
| 14 | Karnataka | 17.0266 | 2.2154 | 14.8112 | 8.5916 | 0.8198 | 9.4114 | 64 |
| 15 | Kerala | 6.6864 | 0.6134 | 6.0730 | 1.3046 | 1.5310 | 2.8355 | 47 |
| 16 | Madhya Pradesh | 35.0406 | 1.7520 | 33.2886 | 17.4809 | 1.3527 | 18.8335 | 57 |
| 17 | Maharashtra | 33.9474 | 1.7955 | 32.1519 | 16.1460 | 1.0293 | 17.1754 | 53 |
| 18 | Manipur | 0.4401 | 0.0440 | 0.3961 | 0.0033 | 0.0007 | 0.0040 | 1.02 |
| 19 | Meghalaya | 1.7805 | 0.1780 | 1.6024 | 0.0015 | 0.0002 | 0.0017 | 0.08 |
| 20 | Mizoram | 0.0304 | 0.0030 | 0.0273 | 0.0000 | 0.0010 | 0.0010 | 3.52 |
| 21 | Nagaland | 0.6159 | 0.0616 | 0.5543 | 0.0000 | 0.0340 | 0.0340 | 6.13 |
| 22 | Odisha | 17.7768 | 1.0859 | 16.6909 | 3.8126 | 0.9162 | 4.7288 | 28 |
| 23 | Punjab | 22.5300 | 2.2100 | 20.3200 | 34.1700 | 0.7100 | 34.8800 | 172 |
| 24 | Rajasthan | 11.9414 | 1.1125 | 10.8290 | 13.1332 | 1.7098 | 14.8430 | 137 |
| 25 | Sikkim* | - | - | 0.0442 | 0.0027 | 0.0086 | 0.0113 | 26 |
| 26 | Tamil Nadu | 21.5326 | 2.1533 | 19.3793 | 13.1688 | 1.7638 | 14.9326 | 77 |
| 27 | Tripura | 2.5866 | 0.2286 | 2.3580 | 0.0932 | 0.0694 | 0.1626 | 7 |
| 28 | Uttar Pradesh | 77.1900 | 5.5300 | 71.6600 | 48.7400 | 4.0400 | 52.7800 | 74 |
| 29 | Uttarakhand | 2.0403 | 0.0449 | 1.9954 | 1.1033 | 0.0298 | 1.1331 | 57 |
| 30 | West Bengal | 29.2511 | 2.6688 | 26.5823 | 9.7195 | 0.9731 | 10.6926 | 40 |
| | Total (States) | 432.11 | 34.55 | 397.60 | 222.21 | 22.66 | 244.85 | 62 |
| | Union Territories | | | | | | | |
| 1 | Andaman & Nicobar | 0.3080 | 0.0216 | 0.2865 | 0.0006 | 0.0121 | 0.0127 | 4.44 |
| 2 | Chandigarh | 0.0216 | 0.0022 | 0.0194 | 0.0000 | 0.0000 | 0.0000 | 0 |
| 3 | Dadara & Nagar Haveli | 0.0622 | 0.0031 | 0.0591 | 0.0072 | 0.0056 | 0.0129 | 22 |
| 4 | Daman & Diu | 0.0181 | 0.0012 | 0.0169 | 0.0145 | 0.0019 | 0.0164 | 97 |
| 5 | Lakshdweep | 0.0105 | 0.0070 | 0.0035 | 0.0000 | 0.0023 | 0.0023 | 67 |
| 6 | Puducherry | 0.1893 | 0.0190 | 0.1703 | 0.1237 | 0.0293 | 0.1530 | 90 |
| | Total (UTs) | 0.6100 | 0.0500 | 0.5600 | 0.1500 | 0.0500 | 0.2000 | 36 |
| | GRAND TOTAL | 432.7200 | 34.6000 | 398.1600 | 222.3600 | 22.7100 | 245.0500 | 62 |

* Note: Net ground water availability in Sikkim has been estimated based on spring discharge and is not reflected in the corresponding column of total annual replenishable resource (column no.3). This results in a difference of 0.044 bcm in the State (Total) and Grand (Total).

ANNEXURE - II

LOCATION DETAILS OF OF DARK BLOCKS (OVER-EXPLOITED ASSESSMENT UNITS)
IN VARIOUS STATES / UTs

| MANDALS IN ANDHRA PRADESH | | | |
|---------------------------|-----------|----|----------------|
| Sl. No. | District | | Over-Exploited |
| 1 | Anantapur | 1 | Agali |
| | | 2 | Amadaguru |
| | | 3 | Amarapuram |
| | | 4 | Bathalapalli |
| | | 5 | Brahmasamudram |
| | | 6 | Gandlapenta |
| | | 7 | Hindupur |
| | | 8 | Kalyandurg |
| | | 9 | Kambadur |
| | | 10 | Kothacheruvu |
| | | 11 | Kundurpi |
| | | 12 | Lepakshi |
| | | 13 | Madakasira |
| | | 14 | Parigi |
| | | 15 | Peddapappur |
| | | 16 | Putlur |
| | | 17 | Rolla |
| | | 18 | Tadimarri |
| | | 19 | Tadipatri |
| | | 20 | Yadiki |
| | | 21 | Yellanur |
| 2 | Chittoor | 1 | Nindra |
| | | 2 | Pakala |
| | | 3 | Penumuru |
| | | 4 | Puthalapattu |
| | | 5 | R.C.Puram |
| | | 6 | Ramakuppam |
| | | 7 | Ramasamudram |
| | | 8 | S R Puram |
| | | 9 | Santhipuram |
| | | 10 | Thavanampalli |
| | | 11 | Tirupathi® |
| 3 | Kadapa | 1 | Pulivendula |
| | | 2 | Vemula |
| 4 | Krishna | 1 | Musunuru |
| 5 | Prakasam | 1 | Dornala |
| | | 2 | Giddaluru |

| | | | |
|--|--|---|--------------|
| | | 3 | Markapuram |
| | | 4 | Peddaraveedu |
| | | 5 | Racherla |
| | | 6 | Y.Palem |

MANDALS IN TELENGANA

| Sl. No. | District | | Over-Exploited |
|---------|------------|----|-------------------|
| 1 | Adilabad | 1 | Nirmal |
| 2 | Hyderabad | 1 | Hyderabad |
| 3 | Khammam | 1 | Tirumalalayapelm |
| 4 | Karimnagar | 1 | Bheemadevarapally |
| | | 2 | Chigurumamidi |
| | | 3 | Gangadhara |
| | | 4 | Husnabad |
| | | 5 | Kathalapur |
| | | 6 | Keshavapatnam |
| | | 7 | Kodimyal |
| | | 8 | Mallial |
| | | 9 | Medipally |
| | | 10 | Mustabad |
| | | 11 | Ramadugu |
| 5 | Medak | 1 | Chinnakodur |
| | | 2 | Dubbak |
| | | 3 | Hathnura |
| | | 4 | Kalher |
| | | 5 | Kondapak |
| | | 6 | Mirdoddi |
| | | 7 | Mulugu |
| | | 8 | Nanganur |
| | | 9 | Narsapur |
| | | 10 | Nyalkal |
| | | 11 | Raikode |
| | | 12 | Siddipet |
| | | 13 | Thoguta |
| | | 14 | Wargal |
| 6 | Nalgonda | 1 | Munugode |
| 7 | Nizamabad | 1 | Kamareddy |
| | | 2 | Sadashivanagar |
| | | 3 | Velpoor |
| 8 | Warangal | 1 | Bachannapet |
| | | 2 | Chennaraopet |

| | | | |
|--|--|----|--------------|
| | | 3 | Duggondi |
| | | 4 | Geesugonda |
| | | 5 | Jangaon |
| | | 6 | Kodakandla |
| | | 7 | Maddur_Wgl |
| | | 8 | Rayaparthi |
| | | 9 | Thorrur |
| | | 10 | Wardhannapet |

| BLOCKS IN CHHATTISGARH | | | |
|------------------------|----------|----------------|-------|
| Sl. No. | District | Over-exploited | |
| 1 | Durg | 1 | Gurur |

| TEHSIL IN DELHI | | | |
|-----------------|------------|----------------|------------------|
| Sl. No. | District | Over-exploited | |
| 1 | Central | 1 | Karol Bagh |
| | | 2 | Pahar Ganj |
| 2 | East | 1 | Preet Vihar |
| | | 2 | Vivek Vihar |
| 3 | North | 1 | Kotwali |
| | | 2 | Sadar Bazar |
| 4 | North East | 1 | Seema Puri |
| | | 2 | Shahdara |
| 5 | North West | 1 | Model Town |
| | | 2 | Saraswati Vihar |
| 6 | South | 1 | Defence Colony |
| | | 2 | Hauz Khas |
| | | 3 | Kalkaji |
| 7 | South West | 1 | Delhi Cantonment |
| | | 2 | Najafgarh |
| | | 3 | Vasant Vihar |
| 8 | West | 1 | Patel Nagar |
| | | 2 | Rajouri Garden |

| TALUKS IN GUJARAT | | | |
|-------------------|-------------|----------------|----------------|
| Sl. No. | District | Over-Exploited | |
| 1 | Ahmedabad | 1 | City - Daskroi |
| 2 | Banaskantha | 1 | Deesa |
| | | 2 | Deodar |

| | | | |
|---|-------------|---|-------------|
| | | 3 | Dhanera |
| | | 4 | Kankrej |
| | | 5 | Tharad |
| | | 6 | Vadgam |
| 3 | Gandhinagar | 1 | Dehgam |
| | | 2 | Gandhinagar |
| | | 3 | Kalol |
| | | 4 | Mansa |
| 4 | Kachchh | 1 | Bhachau |
| | | 2 | Mandvi |
| 5 | Mahesana | 1 | Becharaji |
| | | 2 | Kadi |
| | | 3 | Kheralu |
| | | 4 | Mahesana |
| | | 5 | Satlasan |
| | | 6 | Visanagar |
| | | 7 | Vijapur |
| | | 8 | Unjha |
| 6 | Patan | 1 | Chanasma |
| | | 2 | Patan |
| | | 3 | Sidhpur |
| | | | |

| BLOCKS IN HARYANA | | | |
|-------------------|-----------|---|----------------|
| Sl. No. | District | | Over-Exploited |
| 1 | Ambala | 1 | Barara |
| | | 2 | Naraingarh |
| | | 3 | Saha |
| 2 | Fatehabad | 1 | Fatehabad |
| | | 2 | Ratia |
| | | 3 | Tohana |
| | | 4 | Jakhal |
| | | 5 | Bhuna |
| 3 | Bhiwani | 1 | Badra |
| | | 2 | Dadri-I |
| | | 3 | Kairu |
| | | 4 | Loharu |
| | | 5 | Siwani |
| 4 | Hissar | 1 | Narnaund |
| | | | Hansi-II |
| 5 | Gurgaon | 1 | Farukhnagar |
| | | 2 | Gurgaon |

| | | | |
|----|--------------|---|-----------------|
| | | 3 | Pataudi |
| | | 4 | Sohna |
| 6 | Mewat | | Tauru |
| 7 | Palwal | 1 | Hassanpur |
| | | 2 | Palwal |
| 8 | Jind | 1 | Alewa |
| | | 2 | Narwana |
| | | 3 | Safidon |
| | | 4 | Jind |
| 9 | Kaithal | 1 | Gulha |
| | | 2 | Kaithal |
| | | 3 | Kalyat |
| | | 4 | Pundri |
| | | 5 | Rajaund |
| 10 | Karnal | 1 | Assandh |
| | | 2 | Gharaunda |
| | | 3 | Indri |
| | | 4 | Karnal |
| | | 5 | Nilokheri |
| | | 6 | Nissang |
| | | | |
| 11 | Kurukshetra | 1 | Babain |
| | | 2 | Ladwa |
| | | 3 | Pehowa |
| | | 4 | Shahbad |
| | | 5 | Thaneswar |
| 12 | Mahendragarh | 1 | Ateli |
| | | 2 | Kanina |
| | | 3 | Mahendragarh |
| | | 4 | Nangal Chaudary |
| | | 5 | Narnaul |
| 13 | Panipat | 1 | Bapoli |
| | | 2 | Israna |
| | | 3 | Madlauda |
| | | 4 | Panipat |
| | | 5 | Samalkha |
| 14 | Rewari | 1 | Khol |
| | | 2 | Nahar |
| | | 3 | Rewari |
| | | 4 | Bawal |
| 15 | Sirsa | 1 | Ellenabad |
| | | 2 | Rania |

| | | | |
|----|-------------|---|------------|
| | | 3 | Sirsa |
| | | 4 | Ns Chopta |
| | | 5 | Baraguda |
| | | 6 | Odhan |
| | | 7 | Dabwali |
| 16 | Sonepat | 1 | Ganaur |
| | | 2 | Rai |
| | | 3 | Sonepat |
| 17 | Yamunanagar | 1 | Chachrauli |
| | | 2 | Jagadhri |
| | | 3 | Mustafabad |
| | | 4 | Radour |
| | | 5 | Bilaspur |

| VALLEY IN HIMACHAL PRADESH | | | |
|----------------------------|----------|----------------|-----------------|
| Sl. no. | District | Over-exploited | |
| 1 | Sirmaur | 1 | Kala Amb Valley |

| BLOCKS IN JHARKHAND | | | |
|---------------------|-------------|----------------|------------------|
| Sl. No. | District | Over-exploited | |
| 1 | Dhanbad | 1 | Jharia |
| | | 2 | Dhanbad |
| 2 | E-Singhbhum | 1 | Jamshedpur Sadar |
| 3 | Godda | 1 | Godda |
| 4 | Ramgarh | 1 | Ramgarh |
| 5 | Ranchi | 1 | Kanke |

| TALUKAS IN KARNATAKA | | | |
|----------------------|-----------------|----------------|--------------|
| SI No | Districts | Over-Exploited | |
| 1 | Bagalkote | 1 | Badami |
| | | 2 | Badami |
| | | 3 | Bagalkote |
| | | 4 | Bagalkote |
| | | 5 | Hungund |
| | | 6 | Mudhol |
| 2 | Bangalore Rural | 1 | Devenhalli |
| | | 2 | Dodaballapur |
| | | 3 | Hoskote |

| | | | |
|----|-----------------|---|-----------------|
| | | 4 | Nelamangala |
| 3 | Bangalore Urban | 1 | Anekal |
| | | 2 | Bangalore East |
| | | 3 | Bangalore North |
| | | 4 | Bangalore South |
| 4 | Belgaum | 1 | Athani |
| | | 2 | Chikodi |
| | | 3 | Gokak |
| | | 4 | Hukkeri |
| | | 5 | Ramdurg |
| | | 6 | Ramdurg |
| | | 7 | Raybag |
| | | 8 | Saundatti |
| 5 | Bellary | 1 | H.B.Halli |
| 6 | Chamrajnagara | 1 | Gundlupet |
| 7 | Chikballapur | 1 | Chikballapur |
| | | 2 | Chintamani |
| | | 3 | Gauribidalur |
| | | 4 | Gudibanda |
| | | 5 | Sidlaghata |
| 8 | Chikmagalur | 1 | Kadur |
| 9 | Chitradurga | 1 | Challakere |
| | | 2 | Chitradurga |
| | | 3 | Hiriyur |
| | | 4 | Holalkere |
| 10 | Davangere | 1 | Channagiri |
| | | 2 | Davangere |
| | | 3 | Harpanahalli |
| | | 4 | Jagalur |
| 11 | Gadag | 1 | Gadag |
| | | 2 | Ron |
| 12 | Hassan | 1 | Arsikere |
| | | 2 | C R Patna |
| | | 3 | Holenarsipur |
| 13 | Kolar | 1 | Bangarpet |
| | | 2 | Kolar |
| | | 3 | Malur |
| | | 4 | Mulbagal |
| | | 5 | Srinivaspur |
| 14 | Koppal | 1 | Gangawati |
| | | 2 | Koppal |
| 15 | Mandya | 1 | Krishnarajpet |
| | | 2 | Malavalli |
| | | 3 | Mandya |

| | | | |
|----|------------|---|-------------------|
| | | 4 | Pandavapura |
| 16 | Mysore | 1 | Krishnrajanagara |
| 17 | Ramanagara | 1 | Kanakapura |
| | | 2 | Ranmanagara |
| 18 | Tumkur | 1 | Chicknayakanhalli |
| | | 2 | Koratagere |
| | | 3 | Madhugiri |
| | | 4 | Tiptur |
| | | 5 | Tumkur |
| | | 6 | Turuvekere |

BLOCKS IN KERALA

| Sl. No. | District | | Over-Exploited |
|---------|----------|---|----------------|
| 1 | Palakkad | 1 | Chittoor |

BLOCKS IN MADHYA PRADESH

| Sl. No. | District | | Over-Exploited |
|---------|----------|---|-----------------|
| 1 | Barwani | 1 | Pansema |
| 2 | Dewas | 1 | Dewas |
| | | 2 | Sonkutch |
| 3 | Dhar | 1 | Badnawar |
| | | 2 | Dhar |
| | | 3 | Dharamपुरi |
| | | 4 | Nalcha |
| 4 | Gwalior | 1 | Depalpur |
| 5 | Indore | 1 | Indore |
| | | 2 | Sanwer |
| 6 | Mandsaur | 1 | Mandsaur |
| | | 2 | Sitama |
| 7 | Ratlam | 1 | Alote |
| | | 2 | Jaora |
| | | 3 | Piploda |
| | | 4 | Ratlam |
| 8 | Satna | 1 | Rampur Baghalan |
| 9 | Shajapur | 1 | Mohan Barodia |
| | | 2 | Nalkhera |
| | | 3 | Shujalpur |
| | | 4 | Susner |
| 10 | Ujjain | 1 | Badnagar |
| | | 2 | Ghatia |
| | | 3 | Ujjain |

| TALUKAS IN MAHARASHTRA | | | |
|------------------------|------------|----------------|-----------------|
| Sr.No. | District | Over-Exploited | |
| 1 | Ahmednagar | 1 | Rahata |
| 2 | Amravati | 1 | Daryapur |
| | | 2 | Morshi |
| | | 3 | Warud |
| 3 | Buldhana | 1 | Jalgaon (Jamod) |
| 4 | Jalgaon | 1 | Raver |
| | | 2 | Yawal |
| 5 | Nashik | 1 | Deola |
| 6 | Sangli | 1 | Miraj |
| 7 | Solapur | 1 | Malshiras |

| BLOCKS IN PUNJAB | | | |
|------------------|-----------------|----------------|----------------|
| Sl.No | District | Over-Exploited | |
| 1 | Amritsar | 1 | Ajnala |
| | | 2 | Chogawan |
| | | 3 | Harsha China |
| | | 4 | Jandiala |
| | | 5 | Majitha |
| | | 6 | Rayya |
| | | 7 | Tarsika |
| | | 8 | Verka |
| 2 | Barnala | 1 | Barnala |
| | | 2 | Mahal Kalan |
| | | 3 | Sehna |
| 3 | Bathinda | 1 | Phul |
| | | 2 | Maur |
| | | 3 | Bathinda |
| 4 | Faridkot | 1 | Faridkot |
| | | 2 | Kot Kapura |
| 5 | Fatehgarh Sahib | 1 | Khera |
| | | 2 | Sirhind |
| | | 3 | Amloh |
| | | 4 | Bassi Pathana |
| | | 5 | Khamanon |
| 6 | Ferozepur | 1 | Fazilka |
| | | 2 | Ferozpur |
| | | 3 | Ghall Khurd |
| | | 4 | Guru Har Sahai |
| | | 5 | Jalalabad |
| | | 6 | Makhu |

| | | | |
|----|------------|----|-------------------|
| | | 7 | Mamdot |
| | | 8 | Zira |
| 7 | Gurdaspur | 1 | Batala |
| | | 2 | Fatehgarh Churian |
| | | 3 | Kahnuwan |
| | | 4 | Kalanaur |
| | | 5 | Qadian |
| | | 6 | Sri Hargobindpur |
| | | 7 | Dera Baba Nanak |
| | | 8 | Dhariwal |
| 8 | Hoshiarpur | 1 | Dasuya |
| | | 2 | Garhsahnkar |
| | | 3 | Hazipur |
| | | 4 | Tanda |
| 9 | Jalandhar | 1 | Adampur |
| | | 2 | Bhogpur |
| | | 3 | Rurka Kalan |
| | | 4 | Jalandhar-East |
| | | 5 | Jalandhar-West |
| | | 6 | Lohian |
| | | 7 | Nakodar |
| | | 8 | Nur Mahal |
| | | 9 | Phillaur |
| | | 10 | Shahkot |
| 10 | Kapurthala | 1 | Nadala |
| | | 2 | Dhilwan |
| | | 3 | Kapurthala |
| | | 4 | Phagwara |
| | | 5 | Sultanpur Lodhi |
| 11 | Ludhiana | 1 | Dehlon |
| | | 2 | Doraha |
| | | 3 | Jagraon |
| | | 4 | Khanna |
| | | 5 | Ludhiana |
| | | 6 | Mangat |
| | | 7 | Pakhowal |
| | | 8 | Raikot |
| | | 9 | Samrala |
| | | 10 | Sidhwan Bet |
| | | 11 | Sudhar |
| 12 | Mansa | 1 | Bhikhi |
| | | 2 | Budhlada |

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|----|-------------|---|--------------------------|
| | | 3 | Jhunir |
| | | 4 | Mansa |
| | | 5 | Sardulgarh |
| 13 | Moga | 1 | Bagha Purana |
| | | 2 | Dharamkot (Kot Isa Khan) |
| | | 3 | Moga I |
| | | 4 | Moga li |
| | | 5 | Nihal Singh Wala |
| 14 | Nawan Shahr | 1 | Aur |
| | | 2 | Nawan Shahr |
| | | 3 | Banga |
| 15 | Patiala | 1 | Bhuner Heri |
| | | 2 | Ghanaur |
| | | 3 | Nabha |
| | | 4 | Patiala |
| | | 5 | Rajpura |
| | | 6 | Samana |
| | | 7 | Sanaur |
| | | 8 | Patran |
| 16 | Ropar | 1 | Chamkaur Sahib |
| | | 2 | Morinda |
| | | 3 | Nurpur Bedi |
| 17 | Mohali | 1 | Dera Bassi |
| | | 2 | Kharar |
| 18 | Sangrur | 1 | Ahmedgarh |
| | | 2 | Andana |
| | | 3 | Bhiwanigarh |
| | | 4 | Dhuri |
| | | 5 | Lehraghaga |
| | | 6 | Maler Kotla |
| | | 7 | Sangrur |
| | | 8 | Sherpur |
| | | 9 | Sunam |
| 19 | Tarn Taran | 1 | Bhikhiwind |
| | | 2 | Chola Sahib |
| | | 3 | Gandiwind |
| | | 4 | Khadur Sahib |
| | | 5 | Naushehra Panuan |
| | | 6 | Patti |
| | | 7 | Tarn Taran |
| | | 8 | Valtoha |

| BLOCKS IN TAMIL NADU | | | |
|----------------------|------------|----------------|-------------------------------|
| Sl. No | District | Over-Exploited | |
| 1 | Ariyalur | 1 | Suthamalli |
| 2 | Chennai | 1 | Egmore - Nungambakkam--I |
| | | 2 | Egmore - Nungambakkam--li |
| | | 3 | Egmore - Nungambakkam--lii |
| | | 4 | Egmore - Nungambakkam--lv |
| | | 5 | Kottai - Thondiarpct-I |
| | | 6 | Kottai - Thondiarpct-li |
| | | 7 | Kottai - Thondiarpct-lii |
| | | 8 | Kottai - Thondiarpct-lv |
| | | 9 | Mambalam - Guindy-I |
| | | 10 | Mambalam - Guindy-li |
| | | 11 | Mambalam - Guindy-lii |
| | | 12 | Mambalam - Guindy-lv |
| | | 13 | Mylapore - Tiruvallikeni--I |
| | | 14 | Mylapore - Tiruvallikeni--li |
| | | 15 | Mylapore - Tiruvallikeni--lii |
| | | 16 | Mylapore - Tiruvallikeni--lv |
| | | 17 | Purasawalkam - Perambur-I |
| | | 18 | Purasawalkam - Perambur-li |
| | | 19 | Purasawalkam - Perambur-lii |
| | | 20 | Purasawalkam - Perambur-lv |
| 3 | Coimbatore | 1 | Annur(N) |
| | | 2 | Anupparpalayam |
| | | 3 | Coimbatore South |
| | | 4 | Ganapathi |
| | | 5 | Karumathampatti |
| | | 6 | Kinathukatavu |
| | | 7 | Kolarpatti |
| | | 8 | Kovilpalayam |
| | | 9 | Perianaickenpalayam |
| | | 10 | Perianegamam |
| | | 11 | Perur |
| | | 12 | Pollachi(N) |
| | | 13 | Pollachi(S) |
| | | 14 | Ramapattinam |
| | | 15 | Selakkarichal |
| | | 16 | Singanallur |
| | | 17 | Sulur |
| | | 18 | Thondamuthur |

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|---|------------|----|-------------------|
| | | 19 | Thudialur |
| | | 20 | Vadachittur |
| | | 21 | Varapatti |
| 4 | Cuddalore | 1 | Kammapuram(E) |
| | | 2 | Kammapuram(W) |
| | | 3 | Pennadam |
| | | 4 | Retty Chavadi |
| | | 5 | Thiruvanthipuram |
| | | 6 | Umangalam |
| | | 7 | Virudhachalam (S) |
| 5 | Dharmapuri | 1 | Bommidi |
| | | 2 | Indur |
| | | 3 | Kadathur |
| | | 4 | Kambainallur |
| | | 5 | Karimangalam |
| | | 6 | Marandahalli |
| | | 7 | Palacode |
| | | 8 | Palayam |
| | | 9 | Papparapatty |
| | | 10 | Pennagaram |
| | | 11 | Perumbalai |
| | | 12 | Pulikarai |
| | | 13 | Thenkaraikottai |
| | | 14 | Vellichandai |
| 6 | Dindigul | 1 | Ayyampalayam |
| | | 2 | Batlagundu |
| | | 3 | Chinnakkampatti |
| | | 4 | Chinnalpatti |
| | | 5 | Devathur |
| | | 6 | Eriodu |
| | | 7 | Kallimanthayam |
| | | 8 | Kottanatham |
| | | 9 | Kovilur |
| | | 10 | Nilakottai |
| | | 11 | Oddanchathram |
| | | 12 | Palakkanoothu |
| | | 13 | Palayam |
| | | 14 | Puliyurnatham |
| | | 15 | Reddiarchatram |
| | | 16 | Sanarpatti |
| | | 17 | Silvathur |
| | | 18 | Thoppampatti |

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|----|--------------|----|-------------------|
| | | 19 | Vadamadurai |
| | | 20 | Vedasandur |
| | | 21 | Viruveedu |
| 7 | Erode | 1 | Bhavanisagar |
| | | 2 | Chennimalai |
| | | 3 | Elathur |
| | | 4 | Erode East |
| | | 5 | Erode North |
| | | 6 | Kodumudi |
| | | 7 | Modakurichi |
| | | 8 | Nambiyur |
| | | 9 | Perundurair |
| | | 10 | Punjaipuliampatti |
| | | 11 | Vellode |
| 8 | Kancheepuram | 1 | Govindhavadi |
| | | 2 | L.Endathur |
| | | 3 | Orathi |
| | | 4 | Sirukaveripakkam |
| | | 5 | Thiruppu Kuzhi |
| | | 6 | Walajabad |
| 9 | Karur | 1 | K.Paramathy |
| | | 2 | Kadavur |
| | | 3 | Mailampatti |
| | | 4 | Pallapatti |
| | | 5 | Pugalur |
| | | 6 | Thennilai |
| | | 7 | Thoranakalpatti |
| | | 8 | Vangal |
| | | 9 | Velliyanai |
| 10 | Krishnagiri | 1 | Alapatti |
| | | 2 | Bargur |
| | | 3 | Guruparapalli |
| | | 4 | Kallavi |
| | | 5 | Krishnagiri |
| | | 6 | Mathur |
| | | 7 | Palepalli |
| | | 8 | Pochampalli |
| | | 9 | Samalpatti |
| | | 10 | Samarapatti |
| | | 11 | Singarapettai |
| | | 12 | Uthangarai |
| | | 13 | Veppanapalli |

| | | | |
|----|--------------|----|--------------------|
| 11 | Madurai | 1 | Usilampatti |
| | | 2 | Uthappanaickanur |
| | | 3 | Muduvarpatti |
| | | 4 | Palamedu |
| 12 | Nagapattinam | 1 | Kariyapattinam |
| | | 2 | Kuttalam |
| | | 3 | Manganallur |
| | | 4 | Mayiladuthurai |
| | | 5 | Melaiyur |
| | | 6 | Palaiyur |
| | | 7 | Pattavarthi |
| | | 8 | Puthur |
| | | 9 | Sembanarkoil |
| | | 10 | Thiruvilaiyattam |
| | | 11 | Vaitheeswaran Koil |
| 13 | Namakkal | 1 | Erumaipatti |
| | | 2 | Kalappanaikanpatti |
| | | 3 | Mallasamudram |
| | | 4 | Mangalapuram |
| | | 5 | Mohanur |
| | | 6 | Mullukurichi |
| | | 7 | Nallipalayam |
| | | 8 | Nallur |
| | | 9 | Namagiripettai |
| | | 10 | Namakkal |
| | | 11 | Paramathi |
| | | 12 | Puduchatram |
| | | 13 | Rasipuram |
| | | 14 | Sellappampatti |
| | | 15 | Senthamagalam |
| | | 16 | Vaiyappamalai |
| | | 17 | Valaiyapatti |
| | | 18 | Vennandur |
| 14 | Perambalur | 1 | Chettikulam |
| | | 2 | Kurumbalur |
| | | 3 | Pasumbalur |
| | | 4 | Perambalur |
| | | 5 | Valikandapuram |
| 15 | Salem | 1 | Attur |
| | | 2 | Edappadi |
| | | 3 | Ernapuram |
| | | 4 | Gangavalli |

| | | | |
|----|-----------|----|---------------------|
| | | 5 | Kadayampatti |
| | | 6 | Karippatti |
| | | 7 | Kattukkottai |
| | | 8 | Konganapuram |
| | | 9 | Malliyakarai |
| | | 10 | Mecheri |
| | | 11 | Nangavalli |
| | | 12 | Omalur |
| | | 13 | Palamalai |
| | | 14 | Panamarathuppatti |
| | | 15 | Pethanaickanpalayam |
| | | 16 | Poolampatti |
| | | 17 | Salem_Town |
| | | 18 | Sankari East |
| | | 19 | Sankari West |
| | | 20 | Semmandappatti |
| | | 21 | Suramangalam |
| | | 22 | Thalaivasal |
| | | 23 | Tharamangalam |
| | | 24 | Thirumalaigiri |
| | | 25 | Valasaiyur |
| | | 26 | Vazhappadi |
| | | 27 | Veerapandi |
| | | 28 | Vembadithalam |
| | | 29 | Yethapur |
| 16 | Thanjavur | 1 | Adirampattinam |
| | | 2 | Aduthurai |
| | | 3 | Ammappettai |
| | | 4 | Avanam |
| | | 5 | Ayyampettai |
| | | 6 | Devanancheri |
| | | 7 | Kabisthalam |
| | | 8 | Kandiyur |
| | | 9 | Kathiramangalam |
| | | 10 | Kumbakonam |
| | | 11 | Kuruchi |
| | | 12 | Kuruvikarambai |
| | | 13 | Melattur |
| | | 14 | Murukkangudi |
| | | 15 | Nachiyarkoil |
| | | 16 | Nadukaveri |
| | | 17 | Nambivayal |

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|----|-------------|----|-----------------------|
| | | 18 | Nanjikottai |
| | | 19 | Pandanallur |
| | | 20 | Papanasam |
| | | 21 | Pattukkottai |
| | | 22 | Ramapuram |
| | | 23 | Thanjavur |
| | | 24 | Thirumangalakottai |
| | | 25 | Thiruvaiyaru |
| | | 26 | Thiruidamarudur |
| | | 27 | Thondarampattu |
| | | 28 | Tiruchitrabalam |
| | | 29 | Tiruppanandal |
| 17 | Theni | 1 | Erasakkanaickanur |
| | | 2 | Kandamanur |
| | | 3 | Kodivilarpatti |
| | | 4 | Rajathani |
| | | 5 | Thevaram |
| 18 | Thiruvallur | 1 | Ambattur |
| | | 2 | Avadi |
| | | 3 | Balapuram |
| | | 4 | Cherukkanoor |
| | | 5 | Erumbi |
| | | 6 | Kadambathur |
| | | 7 | Kannigaipair |
| | | 8 | Mappedu |
| | | 9 | Pallipattu |
| | | 10 | R.K.Pet |
| | | 11 | Thiruniravur |
| | | 12 | Vengathur |
| 19 | Thoothukudi | 1 | Ilayarasanandal |
| | | 2 | Ottapidaram |
| | | 3 | Pallakurichi |
| | | 4 | Sattankulam |
| | | 5 | Udangudi |
| 20 | Tirunelveli | 1 | Kallurani |
| | | 2 | Karisal Kulam |
| | | 3 | Karivaklamvandanallur |
| | | 4 | Karuvantha |
| | | 5 | Kurukkalpatti |
| | | 6 | Pazhankottai |
| | | 7 | Pazhavor |
| | | 8 | Radhapuram |

| | | | |
|----|----------------|----|--------------------|
| | | 9 | Sankarankoil |
| | | 10 | Sernthamangalam |
| | | 11 | Surandai |
| | | 12 | Tisayanvilai |
| | | 13 | Uthumalai |
| | | 14 | Vannikonenthal |
| | | 15 | Veerasingamani |
| 21 | Tiruppur | 1 | Avinashi(E) |
| | | 2 | Avinashi(W) |
| | | 3 | Avinashipalayam(S) |
| | | 4 | Cheyur |
| | | 5 | Gudimangalam |
| | | 6 | Kangeyam |
| | | 7 | Kannivadi |
| | | 8 | Karadivavi |
| | | 9 | Kundadam |
| | | 10 | Kunnathur |
| | | 11 | Mulanur |
| | | 12 | Palladam |
| | | 13 | Periavalavadi |
| | | 14 | Perumanallur |
| | | 15 | Pethappampatti |
| | | 16 | Pongalur |
| | | 17 | Ponnapuram |
| | | 18 | Samalapuram |
| | | 19 | Sankarandampalayam |
| | | 20 | Tiruppur (N) |
| | | 21 | Tiruppur (S) |
| | | 22 | Uthiyur |
| | | 23 | Uthukuli |
| 22 | Tiruvarur | 1 | Agarathirumalam |
| | | 2 | Alangudi |
| | | 3 | Avoor |
| | | 4 | Kodavasal |
| | | 5 | Koradacheri |
| | | 6 | Kulikkarai |
| | | 7 | Peralam |
| | | 8 | Thirukkannamangai |
| | | 9 | Valangaiman |
| 23 | Tiruvannamalai | 1 | Chengam |
| | | 2 | Cheyyar |
| | | 3 | Kilpennathur |

| | | | |
|----|---------|----|---------------------|
| | | 4 | Melpallipattu |
| | | 5 | Somaspadi |
| | | 6 | Thandarampat |
| | | 7 | Thurinjapuram |
| | | 8 | Veraiyur |
| 24 | Trichy | 1 | Kannanur |
| | | 2 | Kariyamanickam |
| | | 3 | Koppampatti |
| | | 4 | Manapparai |
| | | 5 | Manikandam |
| | | 6 | Marungapuri |
| | | 7 | Pannappatti |
| | | 8 | Pulivalam |
| | | 9 | Sengattuppatti |
| | | 10 | Thathaiyangarpettai |
| | | 11 | Thumbalam |
| | | 12 | Thuraiyur |
| | | 13 | V.Periyapatti |
| | | 14 | Vaiyampatti |
| | | 15 | Valaieduppu |
| 25 | Vellore | 1 | Ambalur |
| | | 2 | Ambur |
| | | 3 | Ammanankoil |
| | | 4 | Anaicut |
| | | 5 | Arcot |
| | | 6 | Gudiyatham (West) |
| | | 7 | Gudiyatham(East) |
| | | 8 | Jolarpet |
| | | 9 | K.V.Kuppam |
| | | 10 | Kalavai |
| | | 11 | Katpadi |
| | | 12 | Madhanur |
| | | 13 | Melpatti |
| | | 14 | Melasannankuppam |
| | | 15 | Nemili |
| | | 16 | Pallikonda |
| | | 17 | Pudupadi |
| | | 18 | Sathuvachari |
| | | 19 | Thuthipattu |
| | | 20 | Timiri |
| | | 21 | Tirupathur |
| | | 22 | Ussoor |

| | | | |
|----|--------------|----|--------------------|
| | | 23 | Vaduganthangal |
| | | 24 | Valathur |
| | | 25 | Vaniyambadi |
| | | 26 | Vellore |
| 26 | Villupuram | 1 | Anniyur |
| | | 2 | Arasur |
| | | 3 | Avalurpettai |
| | | 4 | Brammadesam |
| | | 5 | Chithalingamadam |
| | | 6 | Elavanasurkottai |
| | | 7 | Eraiur |
| | | 8 | Gingee |
| | | 9 | Indili |
| | | 10 | Kalamarudur |
| | | 11 | Kanjanur |
| | | 12 | Kiliyanur |
| | | 13 | Marakkanam |
| | | 14 | Melmalaiyanur |
| | | 15 | Melolakkur |
| | | 16 | Nagalur |
| | | 17 | Nainarpalayam |
| | | 18 | Nemili |
| | | 19 | Olakkur |
| | | 20 | Sathampati |
| | | 21 | Sathiyamangalam |
| | | 22 | Siruvadi |
| | | 23 | Sithalampattu |
| | | 24 | T.V.Nallur |
| | | 25 | Thiyagadurgam |
| | | 26 | Tindivanam |
| | | 27 | Ulundurpettai |
| | | 28 | Uppuvelur |
| | | 29 | Vadasiruvalur |
| | | 30 | Vallam |
| | | 31 | Vanur |
| | | 32 | Vikkiravandi |
| 27 | Virudhunagar | 1 | Cholapuram |
| | | 2 | Keelarajakularaman |
| | | 3 | Nathampatti |
| | | 4 | Rajapalayam |
| | | 5 | Vatchakara-Patti |

| BLOCKS IN RAJASTHAN | | |
|---------------------|-----------|----------------|
| Sl. No. | District | Over-Exploited |
| 1 | Ajmer | 1.Arain |
| | | 2. Bhinai |
| | | 3. Jawaja |
| | | 4. Pisangan |
| | | 5. Silora |
| | | 6. Srinagar |
| | | 7 Kekri |
| | | 8 Masuda |
| 2 | Alwar | 1.Behror |
| | | 2. Bansur |
| | | 3. Kathumar |
| | | 4. Kishangarh |
| | | 5. Kotkasim |
| | | 6. Laxmangarh |
| | | 7. Mandawar |
| | | 8. Neemrana |
| | | 9. Rajgarh |
| | | 10. Ramgarh |
| | | 11. Reni |
| | | 12. Tijara |
| | | 13. Umrain |
| | | 14 Thana ghazi |
| 3 | Baran | 1. Atru |
| | | 2. Baran |
| | | 3 Anta |
| | | 4 Chhipabarod |
| | | 5 Chhabra |
| 4 | Barmer | 1. Baetu |
| | | 2. Balotra |
| | | 3. Dhorimanna |
| | | 4. Siwana |
| | | 5. Sheo |
| 5 | Bharatpur | 1. Nadbai |
| | | 2. Sewar |
| | | 3. Weir |
| | | 4. Roopwas |
| | | 5. Kumher |
| 6 | Bhilwara | 1. Asind |
| | | 2. Banera |
| | | 3. Hurda |

| | | |
|----|-------------|-------------------|
| | | 4. Jahajpur |
| | | 5. Mandal |
| | | 6. Mandalgarh |
| | | 7. Raipur |
| | | 8. Suwana |
| | | 9. Kotri |
| | | 10. Sahada |
| | | 11. Shahpura |
| 7 | Bikaner | 1. Bikaner |
| | | 2. Nokha |
| | | 3. Dungargarh |
| 8 | Bundi | 1. Hindoli |
| | | 2. Nainwa |
| | | 3. Talera |
| 9 | Chittorgarh | 1. Begun |
| | | 2. Bhadesar |
| | | 3. Bhopalsagar |
| | | 4. Chittorgarh |
| | | 5. Dungla |
| | | 6. Gangrar |
| | | 7. Kapasan |
| | | 8. Nimbahera |
| | | 9. Rashmi |
| | | 10. Bari Sadri |
| | | 11. Bhainsrorgarh |
| 10 | Churu | 1. Rajgarh |
| | | 2. Sujangarh |
| 11 | Dausa | 1. Bandikui |
| | | 2. Dausa |
| | | 3. Lalsot |
| | | 4. Mahua |
| | | 5. Sikrai |
| 12 | Dholpur | 1. Dholpu |
| | | 2. Rajakhera |
| | | 3. Baseri |
| 13 | Jaipur | 1. Amer |
| | | 2. Bairath |
| | | 3. Bassi |
| | | 4. Chaksu |
| | | 5. Govindgarh |
| | | 6. JamwaRamgarh |
| | | 7. Jhotwara |

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|----|-----------|------------------|
| | | 8.Kotputli |
| | | 9.Sambher |
| | | 10.Sanganer |
| | | 11Shahpura |
| | | 12.Dudu |
| 14 | Jaisalmer | 1. Jaisalmer |
| | | 2. Sankra |
| 15 | Jalore | 1.Ahore |
| | | 2.Bhinmal |
| | | 3.Jalore |
| | | 4. Jaswantpura |
| | | 5. Raniwara |
| | | 6 Chitalwana |
| | | 7. Sanchore |
| | | 8. Sayla |
| 16 | Jhalawar | 1. Manohar Thana |
| | | 2. Pirawa |
| | | 3.Bakani |
| | | 4.Dag |
| | | 5.J.Patan |
| 17 | Jhunjhunu | 1.Buhana |
| | | 2.Chirawa |
| | | 3.Jhunjhunu |
| | | 4. Khetri |
| | | 5.Nawalgarh |
| | | 6.Surajgarh |
| | | 7.Udaipurwati |
| | | 8. Alsisar |
| 18 | Jodhpur | 1.Balesar |
| | | 2.Bhopalgarh |
| | | 3..Bilara |
| | | 4. Mandore |
| | | 5. Osian |
| | | 6.Baori |
| | | 7.Shergarh |
| | | 8.Phalodi |
| 19 | Karauli | 1.Hindaun |
| | | 2. Sapotra |
| | | 3.Todabhim |
| 20 | Kota | 1. Khairabad |
| | | 2. Sangod |
| 21 | Nagaur | 1. Degana |

| | | |
|----|---------------|------------------|
| | | 2. Didwana |
| | | 3. Kuchaman |
| | | 4. Merta |
| | | 5. Mundwa |
| | | 6. Parbatsar |
| | | 7. Riyan |
| | | 8. Makrana |
| | | 9. Jayal |
| 22 | Pali | 1. Jaitaran |
| | | 2. Marwar Jn |
| | | 3. Rani |
| | | 4. Sojat |
| | | 5. Raipur |
| | | 6. Bali |
| | | 7. Desuri |
| | | 8. Pratapgarh |
| | | 9. Chhoti Sadri |
| | | 10. Arnod |
| 23 | Rajsamand | 1. Amet |
| | | 2. Bhim |
| | | 3. Deogarh |
| | | 4. Khamnor |
| | | 5. Kumbhalgarh |
| | | 6. Railmagra |
| | | 7. Rajsamand |
| 24 | SawaiMadhopur | 1. Gangapur |
| | | 2. SawaiMadhopur |
| | | 3. Bamanwas |
| | | 4. Khandar |
| | | 5. Bonli |
| 25 | Sikar | 1. Danta Ramgarh |
| | | 2. Dhod |
| | | 3. Khandella |
| | | 4. Lachhmangarh |
| | | 5. Neem Ka Thana |
| | | 6. Piprali |
| | | 7. Sri Madhopur |
| 26 | Sirohi | 1. Reodar |
| | | 2. Sheoganj |
| | | 3. Sirohi |
| 27 | Tonk | 1. Malpura |
| | | 2. Newai |

| | | | |
|----|---------|--|------------|
| | | | 3.Uniara |
| 28 | Udaipur | | 1. Badgaon |
| | | | 2. Bhinder |
| | | | 3. Girwa |
| | | | 4.Gogunda |
| | | | 5. Mavli |

| BLOCKS IN UTTAR PRADESH | | | |
|-------------------------|---------------|----|---------------------|
| Sl. No. | DISTRICT NAME | | OVER-EXPLOITED |
| 1 | Agra | 1 | Achhnera |
| | | 2 | Akola |
| | | 3 | Barauli Ahir |
| | | 4 | Bichpuri |
| | | 5 | Etmadpur |
| | | 6 | Fatehabad |
| | | 7 | Fatehpur Sikari |
| | | 8 | Khandauli |
| | | 9 | Saiyan |
| | | 10 | Shamsabad |
| 2 | Aligarh | 1 | Iglas |
| | | 2 | Khair |
| 3 | Allahabad | 1 | Bahadurpur |
| | | 2 | Chaka |
| | | 3 | Dhanupur |
| | | 4 | Holagarh |
| | | 5 | Mau-Aima |
| 4 | Amroha | 1 | Amroha |
| | | 2 | Dhanaura |
| 5 | Baghpat | 1 | Binauli |
| | | 2 | Pilana |
| 6 | Bijnor | 1 | Aaku (Nehtaur) |
| | | 2 | Budhanpur (Seohara) |
| | | 3 | Jaleelpur |
| | | 4 | Noorpur |
| 7 | Budaun | 1 | Ambiapur |
| | | 2 | Islamnagar |
| 8 | Bulandshahar | 1 | Gulauthi |
| | | 2 | Sikandrabad |
| 9 | Chitrakoot | 1 | Karvi |
| 10 | Etah | 1 | Jalesar |

| | | | |
|----|--------------|---|---------------|
| 11 | Fatehpur | 1 | Bhitaura |
| | | 2 | Malawan |
| | | 3 | Teliyani |
| 12 | Firozabad | 1 | Firozabad |
| | | 2 | Khairgarh |
| | | 3 | Narkhi |
| | | 4 | Shikohabad |
| | | 5 | Tundla |
| 13 | G B Nagar | 1 | Bisrakh |
| | | 2 | Jewar |
| 14 | Ghaziabad | 1 | Bhojpur |
| | | 2 | Loni |
| | | 3 | Razapur |
| 15 | Hapur | 1 | Garh |
| | | 2 | Hapur |
| | | 3 | Simbholi |
| 16 | Hathras | 1 | Mursan |
| | | 2 | Sasni |
| 17 | Jaunpur | 1 | Badlapur |
| | | 2 | Karanja Kalan |
| | | 3 | Kerakat |
| | | 4 | Maharajganj |
| | | 5 | Sirkoni |
| 18 | Kannauj | 1 | Jalalabad |
| | | 2 | Talgram |
| 19 | Kanpur Nagar | 1 | Kalyanpur |
| 20 | Kasganj | 1 | Kasganj |
| | | 2 | Sahawar |
| 21 | Kaushambi | 1 | Chail |
| | | 2 | Kara |
| | | 3 | Moorat Ganj |
| | | 4 | Sirathu |
| 22 | Lucknow | 1 | Chinhat |
| 23 | Mahoba | 1 | Jaitpur |
| | | 2 | Panwari |
| 24 | Mainpuri | 1 | Barnahal |
| 25 | Mathura | 1 | Baldeo |
| | | 2 | Nohjhil |
| | | 3 | Raya |
| 26 | Meerut | 1 | Rajpura |
| 27 | Moradabad | 1 | Bilari |
| | | 2 | Chhajlet |

| | | | |
|----|---------------|----|--------------------|
| | | 3 | Dilari |
| 28 | Muzaffarnagar | 1 | Bhaghara |
| | | 2 | Budhana |
| | | 3 | Charthawal |
| | | 4 | Shahpur |
| 29 | Pratapgarh | 1 | Baba Bekhernath |
| | | 2 | Gaura |
| | | 3 | Lakshmanpur |
| | | 4 | Lalganj |
| | | 5 | Mandhata |
| | | 6 | Mangraura |
| | | 7 | Patti |
| | | 8 | Pratapgarh Sadar |
| | | 9 | Rampur-Sangramgarg |
| | | 10 | Sandwa -Chandrika |
| | | 11 | Shivgarh |
| 30 | Rampur | 1 | Chamraua |
| | | 2 | Saidnagar |
| | | 3 | Shahabad |
| | | 4 | Swar |
| 31 | Saharanpur | 1 | Baliakheri |
| | | 2 | Deoband |
| | | 3 | Gangoh |
| | | 4 | Nagal |
| | | 5 | Nakur |
| | | 6 | Nanauta |
| | | 7 | Rampur |
| | | 8 | Saduli Qudim |
| | | 9 | Sarsawa |
| 32 | Sambhal | 1 | Bahjoi |
| | | 2 | Baniakhera |
| | | 3 | Gunnaur |
| | | 4 | Pawansa |
| | | 5 | Sambhal |
| 33 | Shamli | 1 | Kandhala |
| | | 2 | Shamli |
| | | 3 | Un |
| 34 | Varanasi | 1 | Arajiline |

| BLOCKS IN DAMAN & DIU | | | |
|-----------------------|-----------------|----------------|-----|
| Sl. No. | Union Territory | Over-Exploited | |
| 2 | Diu | 1 | Diu |

| REGION IN UT of PUDUCHERRY | | | |
|----------------------------|------------|----------------|------------|
| Sl. No | District | Over-Exploited | |
| 1 | Puducherry | 1 | Puducherry |

ANNEXURE - III

MINUTES OF THE SEVENTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2014-2015) HELD ON TUESDAY, 27 JANUARY, 2015 ON "REVIEW OF GROUND WATER SCENARIO, NEED FOR A COMPREHENSIVE POLICY AND MEASURES TO ADDRESS PROBLEMS IN THE COUNTRY WITH PARTICULAR REFERENCE TO (I) DARK BLOCKS; AND (II) CONTAMINATION OF UNDERGROUND WATER BY CERTAIN INDUSTRIES".

The Committee sat from 1100 hours to 1300 hours in Main Committee Room, Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Hukum Singh - Chairperson

LOK SABHA

2. Shri Radheshyam Biswas
3. Shri Devusinh Chauhan
4. Shri Vinod Kumar B.
5. Shri Murali Mohan Maganti
6. Shri Abhijit Mukherjee
7. Shri Rodmal Nagar
8. Smt. Aparupa Poddar
9. Shri S. P. Y. Reddy
10. Shri Lallu Singh
11. Shri L.K. Vaghela

RAJYA SABHA

12. Shri Balwinder Singh Bhunder
13. Smt. Naznin Faruque
14. Shri Mrinal Miri
15. Shri A.V. Swamy
16. Shri Lal Sinh Vadodia

SECRETARIAT

- | | | |
|-----------------------|---|---------------------|
| 1. Shri A.K. Singh | - | Joint Secretary |
| 2. Shri S. Chatterjee | - | Director |
| 3. Smt. Rita Jaikhani | - | Additional Director |

Ministry of Water Resources, River Development and Ganga Rejuvenation

1. Shri Anuj Kumar Bishnoi, Secretary
2. Dr. Amarjit Singh, Additional Secretary(WR, RD &GR)
3. Dr. Amita Prasad, Jt. Secy. (Admn. & GW) (WR, RD &GR)
4. Shri R. K. Gupta, Director (Ground Water) (WR, RD &GR)
5. Shri Ravindra Singh, Director (WR, RD &GR)
6. Shri K. B. Biswas, Chairman, CGWB
7. Shri K. C. Naik, Member (TT&WQ), CGWB
8. Shri Dipankar Saha, Member (SML) and Member Secretary, CGWA
9. Shri S. K. Sinha, Sc. 'D', CGWB
10. Shri Pratul Saxena, Sc. 'C', CGWB

Ministry of Environment, Forest & Climate Change and Central Pollution Control Board

11. Shri Susheel Kumar, Additional Secretary & Chairman, CPCB
12. Dr. Rashid Hasan, Adviser, MoEF&CC
13. Dr. A. B. Akolkar, Member Secretary, CPCB
14. Shri R. M. Bhardwaj, Sr. Scientist, CPCB
15. Shri N. K. Gupta, Sr. Scientist, CPCB

At the outset, the Chairperson welcomed the Members to the sitting of the Committee convened for oral evidence by the representatives of the Ministry of Water Resources, River Development & Ganga Rejuvenation, Ministry of Environment, Forests and Climate Change and Central Pollution Control Board on the subject "Review of Ground Water Scenario, need for a comprehensive policy and measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries". The Chairperson also proposed that the instant subject selected for examination by

the Committee during 2014-15 at serial no. (iii) of the para no. 671 of Bulletin Part II dated 17 September, 2014 may be slightly modified to make it more comprehensive by including "Contamination of underground water by certain industries" in it. The Committee concurred. The Chairperson then welcomed representatives of the Ministry of Water Resources, River Development & Ganga Rejuvenation, Ministry of Environment, Forests and Climate Change and Central Pollution Control Board to the sitting of the Committee.

2. The Secretary, Ministry of Water Resources, River Development & Ganga Rejuvenation briefed the Committee on the subject, followed by a power point presentation. The Members, inter alia, sought clarifications on various issues as follows: (i) water awareness programme organised by the Ministry including 'India Water Week' (ii) issue of ground water resource estimations and regulatory measures (iii) C&AG Report (2012) on ground water pollution (iv) need to bring 'water' in Concurrent List (v) need for improvement in drinking water quality (vi) declining level of ground water due to excessive withdrawal (vii) need to recharge water in dark blocks (viii) follow-up work by States on National Water Policy 2012 (ix) issue of polluted stretches of rivers, need for proper treatment of industrial effluent (x) and arsenic and fluoride contamination in Murshidabad and Birbhum districts of West Bengal.

3. The Committee then asked the Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation to furnish written replies to those queries raised by Members during the sitting which could not be replied by the representatives orally, viz. to mention (i) the areas / blocks / districts (State / UT wise) in the country which have become 'non-critical' units due to efforts of the Government but which were earlier 'critical' units, and also (ii) the extent and magnitude of arsenic and fluoride contamination present in the underground water in the districts of Murshidabad and Birbhum in the State of West Bengal, including the reasons and measures taken in this regard.

The witnesses then withdrew.

4. A copy of the verbatim proceedings of the sitting was kept for record.

The Committee then adjourned.

ANNEXURE - IV

MINUTES OF THE EIGHTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2014-2015) HELD ON MONDAY, 16 FEBRUARY, 2015 ON "REVIEW OF GROUND WATER SCENARIO, NEED FOR A COMPREHENSIVE POLICY AND MEASURES TO ADDRESS PROBLEMS IN THE COUNTRY WITH PARTICULAR REFERENCE TO (I) DARK BLOCKS; AND (II) CONTAMINATION OF UNDERGROUND WATER BY CERTAIN INDUSTRIES".

The Committee sat from 1100 hours to 1250 hours in Committee Room 'C', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Hukum Singh - Chairperson

LOK SABHA

2. Shri Radheshyam Biswas
3. Shri Sukhbir Singh Jaunpuria
4. Shri Tariq Hameed Karra
5. Shri Vinod Kumar B.
6. Shri Sidhant Mohapatra
7. Shri Abhijit Mukherjee
8. Shri Rodmal Nagar
9. Shri Sanjay Kaka Patil
10. Smt. Aparupa Poddar
11. Shri S. P. Y. Reddy
12. Smt. Sathyabama V.
13. Shri Lallu Singh
14. Shri L.K. Vaghela

RAJYA SABHA

15. Shri Balwinder Singh Bhunder
16. Shri Mrinal Miri
17. Shri A.V. Swamy
18. Shri Lal Sinh Vadodia

SECRETARIAT

- | | | |
|-----------------------|---|---------------------|
| 1. Shri S. Chatterjee | - | Director |
| 2. Smt. Rita Jaikhani | - | Additional Director |

Ministry of Water Resources, River Development and Ganga Rejuvenation

1. Shri Anuj Kumar Bishnoi, Secretary
2. Dr. Amarjit Singh, Additional Secretary(WR, RD &GR)
3. Dr. Amita Prasad, Jt. Secy. (Admn. & GW) (WR, RD &GR)
4. Shri R. K. Gupta, Director (Ground Water) (WR, RD &GR)
5. Shri Ashwin Pandya, Chairman, CWC
6. Shri Pradeep Kumar, Commissioner

Ministry of Rural Development

7. Shri S. M. Vijayanad, Special Secretary
8. Shri R. Subrahmanayam, Joint Secretary

Ministry of Urban Development

9. Shri Durga Shankar Mishra, Additional Secretary (UD)
10. Shri Praveen Prakash, Joint Secretary (Works)
11. Shri J. B. Ravinder, Deputy Adviser (PHEE), CPHEEO

At the outset, the Chairperson welcomed the Members to the sitting of the Committee convened for oral evidence by the representatives of the Ministry of Water Resources, River Development & Ganga Rejuvenation, Ministry of Rural Development and Ministry of Urban Development on the subject "Review of Ground Water Scenario, need for a comprehensive policy and measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries". The Chairperson also proposed that an additional subject "Repair, Renovation and Restoration of Water Bodies" may be selected for examination by the Committee during 2014-15. The Committee concurred.

The representatives from the Ministries of Water Resources, River Development & Ganga Rejuvenation, Ministry of Rural Development and Ministry of Urban Development were called in.

2. The Chairperson then welcomed representatives of the Ministries and after introduction, the Committee took up further discussion on the said subject.

3. The Members, inter alia, sought clarifications on various issues as follows: (i) contribution of MNREGA in development of water resources and desilting of water bodies; (ii) recharging of water resources; (iii) unauthorised encroachment of water bodies; (iv) contribution of JNNURM scheme towards development of water resources, implementation/monitoring of funds; (v) working of Central Pollution Control Board; (vi) working of water treatment and sewage plants; (vii) critical blocks; (viii) need for better coordination between concerned Departments of Government viz. Irrigation Department, Rural Development Department, Nagar Vikas etc.; (ix) need for extending technical help to Gram Panchayat to design water harvesting works in Dark Blocks; (x) need for monitoring of funds district-wise.

4. The Committee then asked the Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation, Ministry of Rural Development and Ministry of Urban Development to furnish written replies to those queries raised by Members during the sitting which could not be replied by the representatives orally.

The witnesses then withdrew.

5. A copy of the verbatim proceedings of the sitting was kept for record.

The Committee then adjourned.

ANNEXURE - V

MINUTES OF THE FOURTEENTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2014-2015) HELD ON TUESDAY, 26 MAY, 2015 ON "REVIEW OF GROUND WATER SCENARIO, NEED FOR A COMPREHENSIVE POLICY AND MEASURES TO ADDRESS PROBLEMS IN THE COUNTRY WITH PARTICULAR REFERENCE TO (I) DARK BLOCKS; AND (II) CONTAMINATION OF UNDERGROUND WATER BY CERTAIN INDUSTRIES".

The Committee sat from 1100 hours to 1320 hours in Main Committee Room, Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Hukum Singh - Chairperson

LOK SABHA

2. Shri Radheshyam Biswas
3. Shri Devusinh Chauhan
4. Shri Tariq Hameed Karra
5. Shri Vinod Kumar B.
6. Shri Sidhant Mohapatra
7. Shri Abhijit Mukherjee
8. Smt. Aparupa Poddar
9. Shri Ram Prasad Sarmah
10. Smt. Sathyabama V.
11. Shri Lallu Singh

RAJYA SABHA

12. Shri Balwinder Singh Bhunder
13. Shri Mir Mohammad Fayaz
14. Shri A. V. Swamy
15. Shri Lal Sinh Vadodia

SECRETARIAT

- | | | |
|------------------------|---|---------------------|
| 4. Shri A.K. Singh | - | Joint Secretary |
| 5. Smt. Rita Jailkhani | - | Additional Director |

REPRESENTATIVE OF THE MINISTRY OF DRINKING WATER AND SANITATION

1. Smt. Vijay Laxmi Joshi, Secretary (DW&S)
2. Shri Satyabrata Sahu, Joint Secretary (Water)
3. Dr. Dinesh Chand, Additional Adviser
4. Shri Rajesh Kumar, Director
5. Shri D. Rajsekher, Deputy Adviser

REPRESENTATIVE OF THE MINISTRY OF AGRICULTURE & COOPERATION

6. Shri Jalaj Srivastava, Additional Secretary, DAC
7. Dr. Alok Sikka, Deputy Director General (NRM)
8. Shri Sanjeev Chopra, Joint Secretary
9. Shri R. B. Sinha, Joint Secretary
10. Shri C. M. Pandey, Additional Commissioner

REPRESENTATIVE OF THE MINISTRY OF COMMERCE AND INDUSTRY

11. Shri Shatrughna Singh , Additional Secretary
12. Shri Shailendra Singh, Joint Secretary
13. Shri Atul Chaturvedi, Joint Secretary
14. Shri Abishek Choudhary, Vice President (DMICDC)
15. Shri D. E. Richards, Director
16. Shri A. P. Singh, Senior Development Officer
17. Shri Kawaljeet Singh, Scientist (CPPRI)
18. Shri L. Ginkhomang, Deputy Secretary (Parl.)

At the outset, the Chairperson welcomed the Members to the sitting of the Committee and observed that the sitting was convened for consideration and adoption of the draft Report on the subject "Review of Ground Water Scenario, need for a comprehensive policy and

measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries”.

(The witnesses were then called in)

2. The Chairperson welcomed the witnesses to the sitting of the Committee and requested them to introduce themselves. After the introduction, the Secretary, Ministry of Drinking Water & Sanitation briefed the Committee on the subject. The Members sought clarifications on various issues viz. (i) the need to estimate the sustainability of ground water in India (ii) the issue of curtailment of budget allocation during 2015-16 in respect of M/o Drinking Water & Sanitation; (iii) the importance of Panchayat Securities under 73rd Constitution Amendment in Programme monitoring and implementation; (iv) Issue of drinking water supply and contamination in backward areas especially in Assam; (v) slippages in ground water reserves; (vi) contamination in ground water due to agriculture and industries and (vii) possibility of inclusion of local MPs in the Committees formed to monitor the disbursement of funds for the schemes formulated by Panchayats in this regard.

3. The Committee then asked the Secretary, Ministry of Drinking Water & Sanitation to furnish written replies to those queries raised by Members during the sitting which could not be replied by the representatives orally.

The witnesses then withdrew.

4. A copy of the verbatim proceedings of the sitting was kept for record.

The Committee then adjourned.

ANNEXURE - VI

MINUTES OF THE SECOND SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2015-2016) HELD ON FRIDAY, 20 NOVEMBER, 2015 ON "REVIEW OF GROUND WATER SCENARIO, NEED FOR A COMPREHENSIVE POLICY AND MEASURES TO ADDRESS PROBLEMS IN THE COUNTRY WITH PARTICULAR REFERENCE TO (I) DARK BLOCKS; AND (II) CONTAMINATION OF UNDERGROUND WATER BY CERTAIN INDUSTRIES".

The Committee sat from 1100 hours to 1135 hours in Committee Room 'C', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Hukum Singh - Chairperson

LOK SABHA

2. Shri Radheshyam Biswas
3. Dr. Sidhant Mohapatra
4. Shri Abhijit Mukherjee
5. Shri Sanjakaka Ramchandra Patil
6. Smt. Aparupa Poddar
7. Shri Vishnu Dayal Ram
8. Smt. V. Sathyabama

RAJYA SABHA

9. Shri Balwinder Singh Bhunder
10. Smt. Naznin Faruque
11. Prof. Mrinal Miri
12. Shri Amar Shankar Sable
13. Shri A. V. Swamy

SECRETARIAT

1. Shri Shiv Kumar - Joint Secretary
2. Smt. Rita Jaikhani - Director
3. Shri Kushal Sarkar - Additional Director

At the outset, the Chairperson welcomed the Members to the sitting of the Committee which was essentially convened for consideration and adoption of the draft Report on the subject "Review of Ground Water Scenario, need for a comprehensive policy and measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries".

2. Thereafter, the Committee took up the draft Report for consideration. The Hon'ble Chairperson categorically observed that he felt certain specific points like adoption of modern technology for judicious, efficient management and utilization and development of both ground water and surface water in the country, removal of encroachments from water bodies, regulating extraction of ground water by installation of water meters, etc. and provision of piped water supply to maximum rural areas in the country and addressing serious situation arising out of a large scale pollution / contamination of ground water in the country especially in the National Capital Region be included in the draft Report so as to elicit an action-oriented and more objective response from the Ministry on these issues and also to make sure that the much considered and concerted efforts made by the Committee in this direction bring forth desired outcome and the Ministry is made more accountable thereby. The Hon'ble Chairperson, however, while placing his appreciation for the Secretariat to the Committee for preparing an excellent and comprehensive Draft Report invited certain specific suggestions from the Members of the Committee on the issues underlined by him. The Members of the Committee also expressed their appreciation for the draft Report.

3. After some discussion, the Committee felt that there was a need of more time to go through the draft Report which happened to be quite a comprehensive one and touch upon various vital aspects of water situation in the country so as to come up with such suggestions. The Members, therefore, desired that a week's time i.e. upto 27 November, 2015 may be given to go through the Report and offer their pertinent suggestions, if any, in writing to the Secretariat for suitable incorporation in the Draft Report. While allowing the same and also in view of the discussions held by the Committee on the issues involved, the Hon'ble Chairperson agreed to

another suggestion of the Committee to postpone the consideration and adoption of the Draft Report to a future date in December, 2015.

The Committee then adjourned.

ANNEXURE - VII

MINUTES OF THE THIRD SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2015-16) HELD ON THURSDAY, 17 DECEMBER 2015

The Committee sat from 1500 hours to 1515 hours in Committee Room 'C', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Hukum Singh – Chairperson

MEMBERS

LOK SABHA

2. Shri Radheshyam Biswas
3. Shri Devusinh Jesingbhai Chauhan
4. Shri Sukhbir Singh Jaunpuria
5. Shri B. Vinod Kumar
6. Shri Maganti Murali Mohan
7. Shri Sidhant Mohapatra
8. Shri Abhijit Mukherjee
9. Shri Rodmal Nagar
10. Shri Subhash Patel
11. Shri Sanjaykaka Ramchandra Patil
12. Shri Vishnu Dayal Ram
13. Shri Ram Prasad Sarmah
14. Smt. V. Sathyabama
15. Shri Lallu Singh

RAJYA SABHA

16. Shri Balwinder Singh Bhunder
17. Smt. Naznin Faruque
18. Mir Mohammad Fayaz
19. Prof. Mrinal Miri
20. Shri Amar Shankar Sable
21. Shri A.V. Swamy
22. Shri Lal Sinh Vadodia

SECRETARIAT

1. Shri Shiv Kumar - Joint Secretary
2. Smt. Rita Jailkhani - Director
3. Shri Kushal Sarkar - Additional Director

2. At the outset, the Chairperson welcomed the Members to the sitting of the Committee. Thereafter, the Committee took up for consideration (a) Draft Report on the subject "Review of Ground Water Scenario, need for a comprehensive policy and measures to address problems in the country with particular reference to (i) Dark Blocks; and (ii) Contamination of underground water by certain industries"; (b) Draft Report on Action Taken by the Government on the Observations / Recommendations contained in the First Report (16th Lok Sabha) on Demands for Grants (2014-15) of the Ministry of Water Resources, River Development & Ganga Rejuvenation; and (c) Draft Report on Action Taken by the Government on the Observations / Recommendations contained in the Third Report (16th Lok Sabha) on Demands for Grants (2015-16) of the Ministry of Water Resources, River Development & Ganga Rejuvenation. After some deliberations, the Committee adopted the aforesaid three draft Reports without any modification.

3. The Committee then authorized the Chairperson to present the above three Reports to both the Houses of Parliament in the current Winter Session.

The Committee then adjourned