

# GROUND WATER MANAGEMENT AND REGULATION

MINISTRY OF JAL SHAKTI

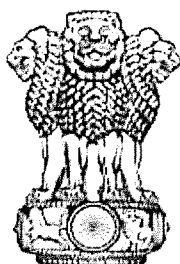
(Department of Water Resources, River Development and Ganga  
Rejuvenation)

PUBLIC ACCOUNTS COMMITTEE  
(2023-24)

SEVENTY FOURTH

---

(SEVENTEENTH LOK SABHA)



सत्यमेव जयते

LOK SABHA SECRETARIAT  
NEW DELHI

**PAC No. 2303**

**SEVENTY FOURTH REPORT**

**PUBLIC ACCOUNTS COMMITTEE**  
**(2023-24)**

**(SEVENTEENTH LOK SABHA)**

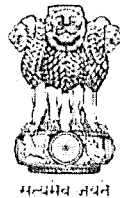
**GROUND WATER MANAGEMENT AND  
REGULATION**

**MINISTRY OF JAL SHAKTI**

**(Department of Water Resources, River Development and Ganga  
Rejuvenation)**

*Presented to Lok Sabha on: 20.09.2023*

*Laid in Rajya Sabha on: 20.09.2023*



**LOK SABHA SECRETARIAT  
NEW DELHI**

September, 2023/ Bhadrapada , 1945 (Saka)

## CONTENTS

Pages

COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE (2021-22)  
COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE (2022-23)  
COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE (2023-24)  
INTRODUCTION

### REPORT PART- I

- A OVERVIEW**
- B MANAGEMENT OF GROUND WATER**
  - (a) Extraction of Ground Water
  - (b) Assessment of Ground Water
  - (c) Ground Water Monitoring
  - (d) Assessment of Ground Water Quantity and Quality
    - (i) Assessment of water levels
    - (ii) Factors affecting Ground Water Quantity
    - (iii) Assessment of Ground Water Quality
  - (e) Model Bill on Ground Water and Legislative framework in States/UTs
  - (f) Human Resource constraints faced by Central agencies managing Ground Water
- C GROUND WATER REGULATION**
  - (a) Projects granted Consent to Operate by State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs) and Projects granted license by Bureau of Indian Standards.
  - (b) Delay in processing of applications by CGWA for grant/renewal of NOC in non-notified areas
  - (c) Non-receipt of applications for renewal on expiry of NOC
  - (d) Post NOC monitoring by CGWA and Authorised officers
- D IMPLEMENTATION OF SCHEMES ON GROUND WATER MANAGEMENT AND REGULATION (GWMR)**
  - (a) Financial performance of GWMRS
  - (b) Targets of aquifer mapping and achievements and incomplete aquifer mapping reports
  - (c) Non preparation of Ground Water Models
  - (d) Dissemination of NAQUIM outputs
    - (i) Designing of web-based system
    - (ii) Action by State Governments on Aquifer mapping reports

- (e) Participatory Ground Water Management
  - (f) Capacity Building
  - (g) Schemes/Initiatives of States/UTs for management of Ground Water
- E. SUSTAINABLE DEVELOPMENT GOALS AND GROUND WATER**
- (a) Target 6.4 — Annual ground water withdrawal against net annual availability
  - (b) Target 6.6 - By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
  - (c) Target 6 b Local communities' participation in water management (Para 5.2.3)
- F. OTHER ISSUES**
- (a) High Yielding Variety Seeds Consuming Less Water
  - (b) National Water System- Desalination And Sustainable Exploitation Of Natural Water Resources
  - (c) Reduction In Use Of Chemical Based Fertilizers
  - (d) Rain Water Harvesting
  - (e) Strengthening Of Central Ground Water Authority

## **PART-II**

### **OBSERVATIONS / RECOMMENDATIONS OF THE COMMITTEE APPENDICES**

- Minutes of the Sitting of Public Accounts Committee (2021-22) held on 28.03.2022
- Minutes of the Sitting of Public Accounts Committee (2022-23) held on 15.06.2022
- Minutes of the Sitting of Public Accounts Committee (2023-24) held on 18.09.2023

**COMPOSITION OF PUBLIC ACCOUNTS COMMITTEE OF  
PARLIAMENT OF INDIA  
(2021-22)**

**Shri Adhir Ranjan Chowdhury** - **Chairperson**

**MEMBERS**

**LOK SABHA**

2. Shri T. R. Baalu
3. Shri Subhash Chandra Baheria
4. Shri Sudheer Gupta
5. Shri Bhartruhari Mahtab
6. Shri Jagdambika Pal
7. Shri Vishnu Dayal Ram
8. Shri Pratap Chandra Sarangi<sup>1</sup>
9. Shri Rahul Ramesh Shewale
10. Shri Gowdar Mallikarjunappa Siddeshwara<sup>2</sup>
11. Shri Rajiv Ranjan Singh alias Lalan Singh
12. Dr. Satya Pal Singh
13. Shri Jayant Sinha
14. Shri Balashowry Vallabhaneni
15. Shri Ram Kripal Yadav

**RAJYA SABHA**

16. Shri Shaktisinh Gohil
17. Shri Bhubaneswar Kalita
18. Dr. C.M. Ramesh
19. Shri Sukhendu Sekhar Ray
20. Shri V. Vijayasai Reddy<sup>3</sup>
21. Dr. M. Thambidurai
22. Dr. Sudhanshu Trivedi<sup>4</sup>

---

<sup>1</sup> Elected w.e.f. 29.07.2021 *vice* Smt. Darshana Jardosh, MP appointed as Minister of State w.e.f. 07.07.2021.

<sup>2</sup> Elected w.e.f. 29.07.2021 *vice* Shri Ajay Kumar Mishra, MP appointed as Minister of State w.e.f. 07.07.2021.

<sup>3</sup> Elected w.e.f. 09.08.2021 *vice* Shri Rajeev Chandrasekhar, MP appointed as Minister of State w.e.f. 07.07.2021.

<sup>4</sup> Elected w.e.f. 09.08.2021 *vice* Shri Bhupender Yadav, MP appointed as Union Minister w.e.f. 07.07.2021.

**COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE**  
**(2022-23)**

**Shri Adhir Ranjan Chowdhury - Chairperson**

**MEMBERS**

**LOK SABHA**

2. Shri Subhash Chandra Baheria
3. Shri Bhartruhari Mahtab
4. Shri Jagdambika Pal
5. Shri Vishnu Dayal Ram
6. Shri Pratap Chandra Sarangi
7. Shri Rahul Ramesh Shewale
8. Shri Gowdar Mallikarjunappa Siddeshwara
9. Shri Brijendra Singh
10. Shri Rajiv Ranjan Singh alias Lalan Singh
11. Dr. Satya Pal Singh
12. Shri Jayant Sinha
13. Shri Balashowry Vallabbhaneni
14. Shri Ram Kripal Yadav
15. Shri Shyam Singh Yadav

**RAJYA SABHA**

16. Shri Shaktisinh Gohli
17. Shri Bhubaneswar Kalita
18. Dr. Amar Patnaik
19. Dr. C. M. Ramesh
20. Shri V. Vijayasai Reddy
21. Dr. M Thambidurai
22. Dr. Sudhanshu Trivedi

**COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE**  
**(2023-24)**

**Shri Adhir Ranjan Chowdhury - Chairperson**

**MEMBERS**

**LOK SABHA**

2. Shri Thalikkottai Rajuthevar Baalu
3. Shri Subhash Chandra Baheria
4. Shri Bhartruhari Mahtab
5. Shri Jagdambika Pal
6. Shri Vishnu Dayal Ram
7. Shri Pratap Chandra Sarangi
8. Shri Rahul Ramesh Shewale
9. Shri Gowdar Mallikarjunappa Siddeshwara
10. Shri Brijendra Singh
11. Shri Rajiv Ranjan Singh *alias* Lalan Singh
12. Dr. Satya Pal Singh
13. Shri Jayant Sinha
14. Shri Balashowry Vallabhaneni
15. Shri Ram Kripal Yadav

**RAJYA SABHA**

16. Shri Shaktisinh Gohli
17. Dr. K. Laxman
18. Shri Derek O' Brien\*
19. Shri Tiruchi Siva
20. Dr. M. Thambidurai
21. Shri Ghanshyam Tiwari
22. Dr. Sudhanshu Trivedi

**SECRETARIAT**

- |    |                            |   |                      |
|----|----------------------------|---|----------------------|
| 1. | Shri T.G Chandrasekhar     | - | Additional Secretary |
| 2. | Smt. Bharti Sanjeev Tuteja | - | Director             |
| 3. | Shri Girdhari Lal          | - | Deputy Secretary     |
| 4. | Shri Vijay Mishra          | - | Executive Officer    |

---

\* Elected w.e.f. 19.08.2023 consequent upon retirement of Shri Sukhendu Sekhar Ray, MP on 18.08.2023.

## INTRODUCTION

I, the Chairperson, Public Accounts Committee (2023-24) having been authorised by the Committee, do present this 74<sup>th</sup> Report (Seventeenth Lok Sabha) on "Ground Water Management and Regulation" based on C&AG Report No. 9 of 2021 relating to the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation.

2. The C&AG Report No. 9 of 2021 was laid on the Table of the House on 21.12.2021.

3. Public Accounts Committee (2021-2022) selected the aforesaid subject and took oral evidence of the representatives of the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation on the subject on 28.03.2022. Considering the gravity of the issues, Public Accounts Committee (2022-23) decided to carry forward the subject and took further evidence of the representatives of the Ministry on 15.06.2022. Based on the oral evidence and written replies, the Committee examined the subject in detail in 2023-24.

4. The Public Accounts Committee (2023-24) considered and adopted the draft Report on the aforementioned subject at their sitting held on 18.09.2023. The Minutes of the sittings are appended to the Report.

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

6. The Committee thank the predecessor Committees for taking oral evidence and for obtaining information on the subject.

7. The Committee would like to express their thanks to the representatives of the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation for tendering evidence before them and furnishing the requisite information to the Committee in connection with the examination of the subject.

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

NEW DELHI;  
18 September, 2023  
27 Bhadrapada, 1945 (Saka)

ADHIR RANJAN CHOWDHURY  
Chairperson,  
Public Accounts Committee



## REPORT

### PART-I

#### A. OVERVIEW

Water is essential for life, living and livelihood. Increasing population, growing urbanisation and rapid industrialisation combined with the need for raising agricultural production generates competing demands for water.

2. Water Resources Scenario in India as on June 2022, was reported to be as under:-
  - a. Water availability – 1,126 Billion Cubic Meters (BCM), utilizable water (Surface water) – 690 (BCM), Annual Groundwater recharge – 436 (BCM).
  - b. There is increasing water demand due to population growth, urbanization and industrialization etc.
  - c. There is Spatial and temporal variability in availability of water.
  - d. 17% of world population, 15% cattle population Vs 4% of water resources.
  - e. India is the largest user of ground water in the world. GW extraction 245 Billion Cubic Meters (BCM) - around 25% of global withdrawals.
  - f. Ground Water accounts for around 64 % of irrigation needs and 80 % of drinking water needs
  - g. Total Assessment units as per 2020 Assessment are 6,965 which are categorised as (i) Over exploited: 1,114 (16 %) , (ii) Critical: 270 (04%) , (iii) Semi-critical: 1,057 (15 %); (iv) Safe: 4,427 (64 %) and (v) Saline: 097 (01 %)
3. Ground Water is defined as water which exists below the surface in the zone of saturation and can be extracted through wells or any other means or emerges as springs and base flows in streams and rivers. Efficient management of ground water is significant for sustainable use of water.
4. India is also committed to achieving the targets under United Nations' Sustainable Development Goals by ensuring availability and sustainable management of water and sanitation for all.
5. National Water Policy for the development and management of water resources and establishing a framework for creation of a system of laws, institutions and plan of action with a unified national perspective was adopted in September 1987, which was updated and revised in 2002 and 2012. The National Water Policy 2012 recognised that ground water was being



exploited inequitably and without any consideration to its sustainability leading to its over-exploitation in several areas. The policy envisaged that there was a need to map the aquifers<sup>1</sup> to know the quantum and quality of groundwater resources (replenishable as well as non-replenishable) in the country which maybe periodically updated. This process should be fully participatory, involving local communities. Further, the National Policy emphasised that declining ground water levels in over-exploited areas needed to be arrested by introducing improved technologies in water use, incentivising efficient water use and encouraging community based management of aquifers. In addition, where necessary, projects for artificial recharge should be undertaken so that extraction is less than the recharge, thereby allowing aquifers to maintain ground water levels.

6. Water being a State subject, the legislation for regulation and development of ground water is to be enacted by the State Governments/Union Territories (UTs). However, the regulation of Ground water utilisation is done both at Central and State levels. At the Apex level, the Department of Water Resources, River Development and Ganga Rejuvenation (DoWR,RD&GR) is allocated with overall planning and policy making for the development of ground water resources and establishment of utilisable resources. In pursuance of the orders of the Hon'ble Supreme Court (1996), the Central Ground Water Authority (CGWA) was constituted (January 1997) for the purpose of regulation and control of ground water management and development and to issue necessary directions for this purpose. In 13 States/UTs (as of March 2019), the regulation of ground water is done by the States themselves through State Ground Water Authority or Government orders.

7. The Central Ground Water Board (CGWB) is the national agency under DoWR,RD&GR for assessment, management and development of ground water resources in the country. Ground water resources are estimated assessment unit wise. As on 31st March 2017, out of 6,881 assessment units all over India, 1,186 have been categorised as Over-exploited, 313 as Critical, 972 as Semi-critical, and 4,310 units as Safe. There are 100 assessment units which are completely saline. The number of Over-exploited and Critical administrative units are significantly higher in Delhi, Haryana, Himachal Pradesh, Punjab and Rajasthan. In Punjab, 80 per cent of the assessment units are critical or over-exploited.

8. CGWA releases guidelines for ground water abstraction from time to time. Under the guidelines (November 2012/November 2015), which were in force at the time of audit, CGWA had notified 162 critical/ over-exploited areas for the purpose of regulation of ground water development. In notified areas, abstraction of ground water was not permissible for any purpose other than drinking and domestic use. In the non-notified areas, CGWA could permit extraction of ground water for industrial/ infrastructural/ mining projects.

9. In pursuance of the directions of the National Green Tribunal, CGWA notified revised guidelines in September 2020. The new guidelines now have pan-India applicability and will prevail in case of any difference with the States' guidelines. Some of the earlier provisions such as notification of areas by CGWA have been dispensed with, while some new provisions, such as differential charges for extraction of ground water in different categories of areas (safe, critical, semi-critical and over-exploited) have been introduced.

10. A Central Sector Scheme on 'Ground Water Management and Regulation' was approved for implementation during XII Plan period (2012-17) with an estimated cost of ₹ 3,319 crore and an overall objective of proper assessment and management of ground water resources so as to ensure its sustainability. The scheme was continued during 2017-20 at an estimated cost of ₹ 992 crore. At the State level, State Governments implement their own schemes for water supply, controlled irrigation, ground water recharge, reducing dependence on ground water, reducing contamination of ground water, etc.

11. C&AG Report No. 9 of 2021 (Performance Audit) on the subject 'Ground Water Management and Regulation' pertaining to Union Government Ministry of Jal Shakti Department of Water Resources, River Development and Ganga Rejuvenation contains significant results of the Performance Audit of Ground Water Management and Regulation for the period 2013-18. The Report deals with the mechanism for management of ground water in the country; issues relating to regulation of ground water by CGWA and State Authorities; implementation of schemes on Ground Water Management and Regulation and the extent of achievement of relevant targets under SDG 6.

12. The Public Accounts Committee (2021-22) selected the subject for detailed examination and report. Considering the significance of the issues involved in the matter, the subject was carried forward by the Public Accounts Committee (2022-23). In the process of examination of the subject, the Committee obtained background material and detailed written replies from the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation. They also took oral evidence of the representatives of the Ministry of Jal Shakti and obtained post evidence replies. The issues so discussed are enumerated in the succeeding paragraphs.

## **B. MANAGEMENT OF GROUND WATER**

### **(a) Extraction of Ground Water**

13. Audit had observed that the percentage of utilisation of ground water with respect to recharge, known as stage of extraction of ground water in the country was 63 per cent (2017).

During the period 2004 to 2017, the stage of extraction of ground water had increased from 58 to 63 per cent. Four States/UTs (Delhi, Haryana, Punjab and Rajasthan) had a stage of extraction of more than 100 per cent, indicating that extraction of ground water had surpassed the recharge of ground water. At the district level, in 24 States/UTs, 267 districts had stage of extraction more than 63 *per cent* ranging from 64 *per cent* to 385 *per cent*. During the same period, the percentage of safe blocks had decreased while the percentage of blocks categorised as semi-critical, critical and over-exploited has steadily increased.

14. When asked about the action been taken by CGWB to prevent high extraction of ground water, especially in areas where it has crossed the stage of extraction of 100 per cent, the Ministry informed as under:

"Though water is a State subject, Central Government has taken number of measures for conservation, management of ground water including effective implementation of rain water harvesting in the country, which can be seen at URL:[http://jalshakti-dowr.gov.in/sites/default/files/Steps\\_to\\_control\\_water\\_depletion\\_Feb2021.pdf](http://jalshakti-dowr.gov.in/sites/default/files/Steps_to_control_water_depletion_Feb2021.pdf).

Central Ground Water Authority (CGWA) has been constituted under Section 3 (3) of the "Environment (Protection) Act, 1986" for the purpose of regulation and control of ground water development and management in the Country. CGWA has advised States/UTs to take measures to promote/adopt artificial recharge to ground water / rain water harvesting. CGWA grants No Objection Certificates (NOCs) for ground water abstraction to industries, infrastructure units and mining projects in feasible areas in certain States/UTs where regulation is not being done by the respective State/UTs. The latest guidelines for control and regulation of groundwater extraction with pan-India applicability was notified by the Ministry on 24 September 2020.

Master Plan for Artificial Recharge to Groundwater- 2020 has been prepared by CGWB in consultation with States/UTs which is a macro level plan indicating various structures for the different terrain conditions of the country including estimated cost. The Master Plan envisages construction of about 1.42 crore Rain water harvesting and artificial recharge structures in the Country to harness 185 Billion Cubic Metre (BCM) of monsoon rainfall. DPR has to be prepared by the concerned line department at an implementable level like any other water supply project or city development project. Implementation has to be done through existing schemes of Central/State governments.

CGWB has taken up Aquifer Mapping and Management Programme during XII Plan, under the scheme of Ground Water Management and Regulation. The Aquifer Mapping is aimed to delineate aquifer disposition and their characterization for preparation of aquifer/ area specific ground water management plans with community participation. The management plans including agriculture sector like crop diversification, sprinkler system, drip irrigation, etc. are shared with the respective State governments for taking appropriate measures / implementation. Further, Public Interaction Programs (PIP) are being organised at grass root level for disseminating the tenets of the Aquifer Management Plans as part of the National Aquifer Mapping and

Management (NAQUIM) Programme for the benefit of the stakeholders including farmers.

CGWB has taken up various artificial recharge projects for demonstrative purposes. These projects can be replicated by the state government at similar hydro-geological settings.

Government of India launched Jal Shakti Abhiyan (JSA) in 2019 in 256 water stressed districts in the country. Further, the campaign "Jal Shakti Abhiyan: Catch the Rain" (JSA:CTR) was launched by the Hon'ble Prime Minister on 22 March 2021. The JSA campaign for the year 2022 has been launched by Hon'ble President of India on 29 March 2022.

Atal Bhujal Yojana (ABHY), a Rs. 6,000 crore scheme with World Bank funding, for sustainable management of ground water with community participation is being taken up in the identified over-exploited and water stressed areas falling in the States of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. This scheme is expected to contribute significantly towards water and food security of the participating States.

In addition, a number of States have done notable work in the field of water conservation/harvesting such as 'Mukhyamantri Jal Swavlamban Abhiyan' in Rajasthan, 'Jalyukt Shibir' in Maharashtra, 'Sujalam Sufalam Abhiyan' in Gujarat, 'Mission Kakatiya' in Telangana, Neeru Chettu' in Andhra Pradesh, Jal Jeevan Hariyali in Bihar, 'Jal Hi Jeevan' in Haryana, 'Pani Bachao, Paisa Kamao' in Punjab and Kudimaramath scheme in Tamil Nadu etc.

The Annual Ground Water Extraction for all uses is 245 BCM, out of which 218 BCM (90%) have been utilized for irrigation activities. A participatory approach for sustainable ground water management appears to be more productive keeping in view the large number of farmers dependent on groundwater based irrigation system. In view of this, States/UTs have been advised to review their free/subsidized electricity policy to farmers to discourage over-extraction of groundwater, bring suitable water pricing policy and may work further towards crop rotation/diversification/other initiatives to reduce over-dependence on groundwater."

15. The Ministry also informed that other important steps taken by the Central Government for sustainable ground water management including prevention of over-exploitation of the ground water in the country to control water depletion and promote rain water harvesting / conservation are as under:

"a. Hon'ble Prime Minister has written a letter to all Sarpanchs on 08.06.2019 regarding the importance of water conservation and harvesting and exhorted them to adopt all appropriate measures to make water conservation a mass movement.

b. Government of India launched Jal Shakti Abhiyan (JSA) in 2019, a time bound campaign with a mission mode approach intended to improve water availability including ground water conditions in the water stressed blocks of 256

districts in India. In this regard, teams of officers from Central Government along-with technical officers from Ministry of Jal Shakti were deputed to visit water stressed districts and to work in close collaboration with district level officials to undertake suitable interventions.

c. National Water Policy (2012) has been formulated by Department of Water Resources, RD & GR, inter-alia advocates rainwater harvesting and conservation of water and highlights the need for augmenting the availability of water through direct use of rainfall. It also inter-alia, advocates conservation of river, river bodies and infrastructure should be undertaken in a scientifically planned manner through community participation. Further, encroachment and diversion of water bodies and drainage channels must not be allowed and wherever, it has taken place, it should be restored to the extent feasible and maintained properly.

d. In compliance to the decision taken by the Committee of Secretaries, an 'Inter Ministerial Committee' under the Chairmanship of Secretary (WR, RD & GR) has been constituted to take forward the subject of 'Push on Water Conservation Related Activities for Optimum Utilization of Monsoon Rainfall'.

e. Ministry has circulated a Model Bill to all the States/UTs to enable them to enact suitable ground water legislation for regulation of its development, which also includes provision of rain water harvesting. So far, 19 States/UTs have adopted and implemented the ground water legislation.

f. Best practices of water conservation by various entities including private persons, NGOs, PSUs etc have been compiled and put on the web site of the Ministry for the benefit of general public. An interactive link on best practices has also been created for receiving inputs from public, which, after necessary evaluation/validation are put on the website for the benefit of the public.

g. Department of Water Resources, RD& GR has instituted National Water awards to incentivize good practices in water conservation and ground water recharge.

h. Mass awareness programmes (Trainings, Seminars, Workshops, Exhibitions, Trade Fares and Painting Competitions etc.) are conducted from time to time each year under the information, Education & Communication (IEC) Scheme of DoWR, RD & GR in various parts of the Country to promote rain water harvesting and artificial recharge to ground water.

i. The Ministry of Rural Development in consultation and agreement with the Department of Water Resources, RD & GR and the Ministry of Agriculture & Farmers' Welfare has developed an actionable framework for Natural Resources

Management (NRM), titled 'Mission Water Conservation' to ensure gainful utilization of funds. The Framework strives to ensure synergies in Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), erstwhile integrated Watershed Management Programme (IWMP) now PMKSY Watershed Development Component and Command Area Development & Water Management (CADWM), given their common objectives. Types of common works undertaken under these programmes/ schemes are water conservation and management, water harvesting, soil and moisture conservation, groundwater recharge, flood protection, land development, Command Area Development & Watershed Management.

j. Central Government supports construction of water harvesting and conservation works primarily through Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC).

k. A joint advisory of Department of Rural development (DoRD), Department of Water Resources, RD & GR (DoWR, RD & GR), Department of Land Resources (DoLR) and Department of Drinking Water & Sanitation (DoDWS) has been issued on 24.04.2020 to all States/UTs to emphasize efforts in the area of water conservation and water management in the country. The activities include augmentation of existing water sources(s), ground water recharge, rainwater harvesting and grey water management and recharge.

l. Model Building Bye Laws (MBBL) 2016 circulated by Ministry of Housing & Urban Affairs include provisions for Rainwater Harvesting and it has been shared with all the States / UTs. So far 33 States / UTs have adopted the provisions of rainwater harvesting of MBBL-2016.

m. Central Ground Water Authority (CGWA) has been constituted under Section 3 (3) of the "Environment (Protection) Act, 1986" for the purpose of regulation and control of ground water development and management in the Country. CGWA has advised States/UTs to take measures to promote/adopt artificial recharge to ground water / rain water harvesting. CGWA grants No Objection Certificates (NOCs) for ground water abstraction to Industries, Infrastructure units and Mining projects in feasible areas in certain States/UTs where regulation is not being done by the respective State/UTs. The latest guidelines for control and regulation of groundwater extraction with pan-India applicability was notified by the Ministry on 24 September 2020."



16. On being asked to elaborate on the actual action being taken across the country for implementing policies relating to ground water recharging, the Ministry informed as under:-

"Water being a State subject the actual action for implementing policies for groundwater recharge need to be taken by States/UTs. However, Central Government has taken a number of important measures for conservation, management of ground water including effective implementation of rain water harvesting in the country, which can be seen at URL:[http://jalshakti-dowr.gov.in/sites/default/files/Steps\\_to\\_control\\_water\\_depletion\\_Feb2021.pdf](http://jalshakti-dowr.gov.in/sites/default/files/Steps_to_control_water_depletion_Feb2021.pdf). Some of the important steps initiated by the Central government to help the States in policy formulation and implementation of recharge initiatives on ground are given in succeeding paras.

(a) Important major policy initiatives by the Central Government are as under:

i. National Water Policy (2012) has been formulated by Department of Water Resources, RD & GR, inter alia, advocates rainwater harvesting and conservation of water and highlights the need for augmenting the availability of water through direct use of rainfall. It also advocates conservation of river, river bodies and infrastructure should be undertaken in a scientifically planned manner through community participation.

ii. Ministry of Housing & Urban Affairs (MoHUA) has formulated guidelines for the States to adopt measures suitable to local conditions, such as Unified Building Bye Laws (UBBL) of Delhi, 2016, Model Building Bye Laws (MBBL), 2016 and Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines, 2014, wherein adequate focus has been given on requirement of rainwater harvesting and water conservation measures. As per MBBL, all buildings having a plot size of 100 sq.m. or, more shall mandatorily include the complete proposal of rainwater harvesting. 33 States/ UTs have adopted the features of these Bye Laws.

iii. This Ministry has circulated a Model Bill to all the States/UTs to enable them to enact suitable ground water legislation for regulation of its development, which also includes provision of rain water harvesting. So far, 19 States/UTs have adopted and implemented the ground water legislation.

(b) To implement these policies, the Central Government works in collaboration with the States/UTs through various Central Sector/Centrally sponsored schemes and suitable technical assistance/advisories. Important initiatives in this regard can be summarized as under:

i. National Aquifer Mapping and Management program (NAQUIM) is being implemented by CGWB as part of Ground Water Management and Regulation (GWM & R) scheme, a Central Sector scheme. NAQUIM envisages mapping of aquifers (water bearing formations), their characterization and development of Aquifer Management Plans to facilitate sustainable management of groundwater resources in the country. NAQUIM outputs are shared with States/UTs for suitable interventions.

ii. Government of India launched Jal Shakti Abhiyan (JSA) in 2019, a timebound campaign with a mission mode approach intended to improve water availability including ground water conditions in the country. In this regard, teams of officers from Central Government along-with technical officers from Ministry of Jal Shakti are deputed to visit districts and to work in close collaboration with district level officials to undertake suitable recharge and other related interventions. Jal Shakti Abhiyan 2021 with the theme 'Catch the Rain - Where it Falls, When it Falls' was launched by Hon'ble Prime Minister on 22.03.2021. Jal Shakti Abhiyan 2022 was launched by Hon'ble President on 29.03.2022.

iii. Ministry of Jal Shakti, Department of Water Resources, RD & GR (DoWR, RD & GR) is implementing Atal Bhujal Yojana (Atal Jal), a Rs. 6,000 crore Central Sector Scheme, for sustainable management of ground water resources with community participation. Atal Jal is being implemented in certain water stressed districts/Gram Panchayats of seven States viz. Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The scheme includes innovative recharge structures including rain water harvesting structures.

iv. Central Ground Water Board (CGWB), in consultation with States/UTs, has prepared 'Master Plan for Artificial Recharge to Groundwater - 2020'. The Master Plan — 2020 is a macro level plan indicating various structures for the different terrain conditions of the country. The Master Plan - 2020 envisages construction of about 1.42 crore rain water harvesting and artificial recharge structures in the country to harness 185 Billion Cubic Metre (BCM).

v. Central Ground Water Board takes up various demonstrative projects in the country to showcase the effectiveness of recharge techniques which can be replicated by the States/UTs. Recently, they have taken up innovative schemes for aquifer rejuvenation in select blocks of the Aspirational Districts and also in Rajasthan. Water harvesting and recharge augmentation have also been carried out through a new technique, bridge-cum- bhandaras in parts of Maharashtra."

17. As regards, the other steps being taken by the Department to see that the people of an area categorized as 'over-exploited' get water in the time of need, apart from increasing the existing network of wells, the Ministry informed as under:-

i. "Water being a State subject, management of water resource including providing water to the people is mainly responsibility of the respective State Governments. To facilitate efforts of State Government, Central Government has taken various important steps for sustainable ground water management in the country including over-exploited areas.

ii. Government of India launched Jal Shakti Abhiyan (JSA) in 2019, a time bound campaign with a mission mode approach intended to improve water availability including ground water conditions in the water stressed blocks of 256 districts in India. In this regard, teams of officers from Central Government along-with technical officers from Ministry of Jal Shakti were deputed to visit water stressed districts and to work in close collaboration with district level officials to undertake suitable interventions.

- iii. In addition, Ministry of Jal Shakti has taken up the "Jal Shakti Abhiyan: Catch the Rain" (JSA:CTR) with the theme "Catch the Rain - Where it Falls When it Falls" to cover all the blocks of all districts (rural as well as urban areas) across the country during 22nd March 2021 to 30th November 2021. The campaign was launched by the Hon'ble Prime Minister on 22.03.2021 (World Water Day). The "Jal Shakti Abhiyan: Catch the Rain" for 2022 was launched by Hon'ble President of India on 29.03.2022.
- iv. National Aquifer Mapping and Management program (NAQUIM) is being implemented by CGWB as part of Ground Water Management and Regulation (GWM & R) scheme, a Central Sector scheme. NAQUIM envisages mapping of aquifers (water bearing formations), their characterization and development of Aquifer Management Plans to facilitate sustainable management of groundwater resources in the country. NAQUIM outputs are shared with States/UTs for suitable interventions including planning of wells, recharge initiatives etc. Further, to generate groundwater aquifer related information in a faster manner, Heli-borne survey has been taken up in certain Arid/Semi-Arid areas of Rajasthan, Gujarat and Haryana. The NAQUIM survey for the entire country has been targeted to be completed by March, 2023.
- v. Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) was launched during the year 2015-16. Two major components of PMKSY, namely, Accelerated Irrigation Benefits Programme (AIBP) and Har Khet Ko Pani (HKKP) are being implemented by this Ministry. PMKSY-AIBP scheme has been continued during 2021 to 2026 with an outlay of Rs. 9,306.80 crore.
- vi. Under AIBP, 99 ongoing Major/Medium Irrigation (MMI) projects spread in 18 States were prioritized. As on date, 46 MMI projects have been reported to be completed by different States. Out of 99 ongoing prioritized projects, 59 MMI projects benefit Drought Prone Areas. The Ultimate Irrigation Potential (UIP) of these 99 projects is 76.03 Lakh Ha. During 2016-2021, an additional potential of 22.74 Lakh Ha has been created through these projects.
- vii. A special package for completion of irrigation projects to address agrarian distress in Vidarbha and Marathwada and other chronically drought prone areas of rest of Maharashtra was sanctioned by Government of India in July, 2018. On completion of the balanced works of these projects, additional irrigation potential of 3.77 Lakh Ha would be created.
- viii. Since August, 2019, Government of India in partnership with

States is implementing Jal Jeevan Mission (JJM) to make provision of potable water to every rural household through tap water connection, including those in water scarce areas across the country, by 2024.

- ix. For ensuring tap water supply in drought-prone areas/areas with inadequate rainfall or dependable ground water sources, provisions have been made under JJM for planning and implementation of bulk water transfer from long distances and regional water supply schemes. In addition, provisions have been made for source recharging, viz. dedicated bore well recharge structures, rain water recharge, rejuvenation of existing water bodies, etc., in convergence with other schemes such as MGNREGS, Integrated Watershed Management Programme (IWMP)), 15<sup>th</sup> Finance Commission tied grants to RLBs/PRIs, State schemes, CSR funds, etc.
- x. In order to enhance recharge of aquifers, especially in arid and semi- arid areas, State Governments have been urged to strengthen/extend existing canal networks and / or build canals so as to transfer surplus flood waters from dams / reservoirs to ponds / lakes and other water bodies and also recharge groundwater during monsoon season.
- xi. Further, for villages in water-scarce areas, in order to save the precious fresh water, States, are also being encouraged to plan new water supply scheme with dual piped water supply system, i.e. supply of fresh water in one and treated grey/waste water in another pipe for non-potable/gardening/toilet flushing use."

18. While reporting the Improvement in Ground Water Resources, the Ministry during the course of examination in their presentation informed as under:-

- i. Annual groundwater recharge in the country has increased by nearly 4.29 BCM
- ii. Annual groundwater extraction has decreased by 3.77 BCM.
- iii. The overall stage of groundwater extraction level in the country has also decreased from 63.33 % to 61.6 %.
- iv. overall improvement observed in groundwater situations in around 576 Assessment units out of 6965 Assessment Units in the country.

19. While delineating the water availability vis-à-vis ground water scenario in the country, the representative of the Ministry, during the course of evidence before the Committee stated as under:-

"..... we are having a total 1126 bcm of water resources in India, out of which surface water constitutes 690 and groundwater is 436. But this is not evenly

available throughout India and throughout all seasons. There is a temporal as well as special variability. Sir, the important thing is that we have got only four per cent of total resource of the world, but we support 70 per cent population and 15 per cent of the cattle population of the world. In addition, to support the ground water situation in India, we are the largest user in the world and we consume one-fourth of the total withdrawal. Our extraction is 245 billion cubic metres (BCM). Ground water supports 65 per cent of the irrigation and 80 per cent of the drinking water needs of India. Bhakra is having a storage of 10 BCM. Recently, in 2020, we have assessed the ground water resources of India. About 35 per cent of the assessment units are OCS blocks – over-exploited, critical and semi-critical blocks. Out of this, OE constitute 16 per cent. If we see the distribution of the resource, 70 per cent resource is in the northern part which is in the alluvial aquifer. It is restricted to majority of eight basins, namely, Ganga, Indus, Godavari, Brahmaputra, Krishna, Mahanadi, Narmada and Cauvery. Rest of the basins have contributed only a very small amount."

#### **(b) Assessment of Ground Water**

20. Audit scrutiny revealed that as per the approved (August 2013) Expenditure Finance Committee(EFC)memorandum for 2012-17, the assessment of ground water resources in terms of ground water quantity, utilisation pattern, stage of extraction of ground water, categorisation of units, etc. was to be done every two years by CGWB. Based on this data, Dynamic Ground Water Assessment Report was to be compiled, to enable further planning and management of ground water by CGWB. During the audit period, CGWB conducted such assessments for 2013 and 2017 and published the Reports in June 2017 and July 2019 respectively. CGWB did not carry out this assessment for 2015 resulting in a gap of four years in assessment between 2013 and 2017.DoWR, RD&GR stated (October 2019) that it had awarded the work related to automation of estimation of these resources to the Indian Institute of Technology, Hyderabad which is likely to reduce the time period substantially for this process. The Department added (January 2020) that the Department was considering undertaking such assessments through use of better technologies such as heli borne surveys which are expected to be more efficient and thereby help in reducing the time taken for such assessments. Audit observed that regular assessment is essential to take up timely interventions for management of ground water. Inability to do the same would hamper the regulation of ground water as the scenario is dynamic in nature.

21. On being asked about the reasons for not conducting assessments of ground water as per norms, the Ministry in a written reply stated as under:

"Ground Water Resource Estimation Committee-1997 (GEC-1997) recommended ground water resource assessment to be carried out once in every five years. National Water Policy (2012) emphasized that the availability of water resources and its use by various sectors in various basins and States in the country need to be assessed scientifically and reviewed at periodic intervals, say every five years. Therefore, Ground Water Resource Assessment (GWRA) has been carried out for assessment year 2004 and 2009. Further, Ministry of Jal Shakti decided to carry out Ground Water Resource Assessment once in every 2 years and consequently assessment for 2011 and 2013 were carried out as per GEC 1997 methodology. In 2015, Ground Water Resource Estimation Committee was constituted to review and revise GEC-1997 methodology. The Ground Water Resource Estimation Committee-2015 (GEC-2015) recommended more frequent assessment of ground water resources keeping in view of rapid change in ground water extraction. The committee observed that the comprehensive assessment of ground water resources is a time intensive exercise and recommended that the resources should be assessed once in every three years. Based on GEC-2015 methodology GW Resource Assessment has been carried out for year 2017 and 2020. Due to revision of GEC-1997 Methodology and final publication of GEC-2015 Methodology in 2017, CGWB could not carry out resource assessment for 2015. Process for assessment of ground water resources for the current year 2021-22 has already been initiated and subsequently these assessments are proposed to be done on an annual basis."

22. As regards the methods being utilized for assessing ground water availability and whether these methods are in conformity with the topography of the country, the Ministry in a written reply stated as under:-

"The methodology recommended by "Ground Water Resource Estimation Committee-2015 (GEC-2015) constituted by the Ministry is being utilized for assessing ground water availability. It is based on the principle of water balance i.e.  $Inflow - Outflow = Change\ in\ Storage\ (of\ an\ aquifer)$ . The methodology is in conformity with the topography of the country. It is recommended that hilly areas wherever slope is greater than 20% may not be considered for ground water recharge. In inhabited hilly areas, where surface and sub-surface runoff is high and generally water level data is missing, it is difficult to compute the various components of water balance equation. Hence it is recommended that wherever spring discharge data is available, the same may be assessed as a proxy for 'ground water resources' in hilly areas."

23. When desired to know as to how the CGWB is ensuring the assessment of water resources on a regular basis, the Ministry in a written reply informed as under:-

"The Dynamic Ground Water Resources of the country are being periodically assessed jointly by Central Ground Water Board (CGWB) and State Government Ground Water Departments under the guidance of State Level Committee at State levels and under the overall supervision of Central Level Expert Group. A cloud-based system for assessment "INDIA-Groundwater Resource Estimation System (IN-GRES)" has been put in place for more accurate and timely completion of assessment of ground water resources. INGRES is a software/web based application developed by Central Ground Water Board (CGWB) in

collaboration with Indian Institute of Technology-Hyderabad (IIT-H) to provide common and standardized platform for Ground Water Resource Assessment for the entire country based on Ground Water Resource Estimation Committee-2015 (GEC-2015) methodology. It has also reduced the time lag between data collection/compilation and final publication. Dynamic Ground Water Resources of India, 2020 have been assessed through 'IN-GRES' and have been published in time.

It has been decided that 2022 onwards Groundwater Resource Assessment for the country will be carried out annually for every water year (June previous year to May next year). A Resolution dated 08 Feb 2022 has been notified in the Gazette of India by this Department on 19 Feb 2022 for constitution of a Central Level Expert Group (CLEG) for overall supervision of the assessment process."

24. While delineating the features of the "India-Groundwater Resource Estimation System", Ministry further informed as under:-

"The assessment involves computation of Annual Ground Water Recharge and Annual Extractable Ground Water Resources, Total Annual Ground Water Extraction (utilization) and the percentage of utilization with respect to Annual Extractable Ground Water Resources (Stage of Extraction, SoE). The assessment units (blocks/taluks/mandals/tehsil/firkas etc.) are categorized based on the Stage of Extraction (SoE) i.e 'Safe' if  $SoE < 70\%$ ; 'Semi-critical' if  $SoE > 70$  and  $\leq 90\%$ ; 'Critical' if  $SoE > 90$  and  $\leq 100\%$  and 'Over-exploited' if  $SoE > 100\%$ . "INDIA-Groundwater Resource Estimation System (IN-GRES)" is a software/web based application developed by Central Ground Water Board (CGWB) in collaboration with Indian Institute of Technology-Hyderabad (IIT-H) for assessment of ground water resources to provide common and standardized platform for Ground Water Resource Assessment for the entire country based on Ground Water Resource Estimation Committee-2015 (GEC-2015) methodology. Main features of INGRES include i) facility for online entry of data at various levels including field level, ii) easy and error free calculations directly through the software, iii) approvals at various levels and iv) publication of the results. The software also acts as a dissemination platform. Computed results are available for visulation through a GIS based interface. The system provides information on assessment-unit wise Annual Ground Water Recharge, Annual Extractable Ground Water Resources, Ground Water Extraction, Stage of Extraction and Categorization of the assessment units etc. Thematic map (GIS) based on the Annual Ground Water Recharge, Annual Ground Water Extraction and categorization of assessment units etc. are also available. The system has resulted in minimizing manual errors in estimation process and reducing the time taken for the assessment exercise."

25. About the periodicity of assessment of Ground Water Resource, the representative of the Ministry, during the course of evidence, stated as under:-

"As suggested by the hon. CAG that our resource estimation should be frequent, we have developed a software in consultation with IIT, Hyderabad and from this year onwards we will be doing it every year."

### **(c) Ground Water Monitoring**

26. Audit noticed that CGWB assesses the water level in the country through its observation wells. In the approved Cabinet Note for the Ground Water Management &

Regulation Scheme (GWMRS) for the XII Plan period (2012-17), CGWB proposed to increase monitoring of wells to measure ground water level from 15,653 wells to 50,000 wells (by March 2017) through an approved scheme called Ground Water Management & Regulation Scheme (GWMRS) for the XII Plan period (2012-17) having an outlay of ` 3,319 crore. CGWB also proposed to undertake Real time Ground Water Monitoring in various aquifers across the country through purpose built wells equipped with Digital Water Level Recorders (DWLRs) and Telemetry in convergence with the ground water component under National Hydrology Project (NHP). It was observed that as of March 2020, CGWB was still planning and was yet to undertake real time Ground Water monitoring through DWLRs and Telemetry which indicated that progress in this area was not as per targets of the GWMR Scheme. Audit also pointed out that as of 31 March 2019, a network of only 15,851 observation wells for monitoring water quality were established. Thus, CGWB was falling behind its targets for establishing monitoring wells and for undertaking Real Time Ground Water monitoring, both of which are crucial for efficient management of ground water resources.

27. When asked about the measures that have been taken by CGWB to increase the number of observation wells and equipping these with DWLRs and Telemetry, the Ministry in a written reply stated as under:-

"CGWB has planned to construct 9,000 Piezometers under GWM&R scheme under project mode. Apart from this, around 7,600 Piezometers have been planned in around 7,600 water stressed Gram Panchayats in the States of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh under Atal Bhujal Yojana. Further, CGWB has planned to install 21,860 DWLRs with telemetry system (9,000 under GWM & R scheme as mentioned above through project mode, 7,600 under Atal Jal and balance 5,260 under convergence with NHP). The contract for 3,400 DWLRs out of 5,260 DWLRs under NHP has been finalized.

28. As regards the current status of number of observation wells, the Ministry in a written reply stated as under:-

"CGWB periodically monitors the groundwater levels throughout the country on a regional scale, four times in a year during the months of March/April/May, August, November and January through a network of monitoring wells. At present, CGWB has a network of 22,835 monitoring wells (As on March 2021). Further, the State Governments also have their own ground water level monitoring network of around 43,500 stations making the total number of ground water monitoring stations in the country around 66,000."

29. The Committee desired to know whether concerned department has undertaken any assessment to gauge the requirement for installation of DWLRs with telemetry system across the country. In this regard, the Ministry informed as under:-



"CGWB & States have worked out the requirement of DWLRs with telemetry system for Over-exploited, Critical & Semi-critical (OCS) and other priority areas. Considering the heterogeneous and varied hydro- geological conditions of the country, the requirement of DWLRs with telemetry varies with higher density in the OCS, urban agglomeration, industrial clusters and coastal areas etc. and lesser density in the safe and other areas and accordingly the requirements of DWLRs have been planned.

Upon installation of the envisaged DWLRs with telemetry, the density of automated monitoring is likely to improve with one automated monitoring station in every 50 sq km in OCS area and other priority areas."

30. Giving the current status of installation of 21,860 DWLRs with telemetry system, the Ministry in a written reply stated as under:-

"Provision of around 33,000 DWLRs under various Central schemes is under different stages of implementation/planning by CGWB and States. Out of this around 6,000 DWLRs have already been installed at sites."

#### **(d) Assessment Of Ground Water Quantity And Quality**

##### **(i) Assessment of water levels**

31. CGWB measures ground water levels four times a year during January, March/April/ May, August and November. Ground water samples are collected from these observation wells once a year during the month of March/April/ May to obtain background information of ground water quality changes on regional scale, which is used for planning ground water development and management programmes.

32. Audit observed that the number of observations wells having water depth more than 40 metres was significant in Rajasthan (20 per cent), Delhi (10 per cent) and Haryana (five per cent). On the other hand, ground water depth was less than five meters in Meghalaya (100 per cent), Nagaland (100 per cent), Puducherry (100 per cent) and Andaman & Nicobar Islands (99 per cent). A comparison of depth to water level of post-monsoon 2018 with the decadal mean of post-monsoon (2008-17) relating to data available from 14,387 observation wells of CGWB indicated that in 5,115 (about 36 per cent) wells there was a rise in water level. However, 9,260 (about 64 per cent) wells showed decline in water level. In 12 wells, there was no change in water level.

##### **(ii) Factors affecting Ground Water Quantity**

33. Audit pointed out that factors affecting ground water quantity were available in respect of 14 States/UTs (Punjab, Assam, Haryana, Gujarat, Jharkhand, Rajasthan, Chhatisgarh, Madhya Pradesh, Andhra Pradesh, Puducherry, West Bengal, Haryana, Bihar and Tamil Nadu). In these States/UTs, power subsidy for agriculture, cultivation of water intensive crops, rainfall deficit and urbanisation/population growth and extensive use of water in irrigation/industries were identified by the States/UTs as the major reasons affecting the quantity of ground water, For the States/UTs in which this assessment was not conducted, the specific factors affecting ground water quantity were not identified, which could pose a constraint in development of effective strategies for management of ground water.

### **(iii) Assessment of Ground Water Quality**

34. Audit scrutiny revealed that CGWB is required to monitor the water quality every year during the pre-monsoon season. Samples are collected in bottles (one litre) after thoroughly rinsing the bottle with the samples to be collected and the bottles are sealed at the site. Collected ground water samples are analysed for major parameters like Calcium, Magnesium, Potassium, Arsenic, Carbonates, Chlorides, Nitrates, Sulphates, Iron, Fluorides, Electrical Conductivity, pH etc. Sample analysis is carried out as per standard procedures outlined in American Public Health Association (APHA) manual.

35. Audit observed that as per the data for 2015 based on 15,165 locations in 32 States tested by CGWB, ground water had levels of contaminants higher than permissible limits of Arsenic (697 locations), Fluoride (637 locations), Nitrate (2,015 locations), Iron (1,389 locations) and Salinity (587 locations).

36. When asked about the efforts made in the country to control the contamination of ground water in excess of permissible limit and specifically in mineral-rich and coastal areas, the Ministry in a written reply stated as under:-

"Water being a State subject, initiatives for water management, including its quality is primarily the responsibility of the States. However, various steps have been taken by the Central Government for facilitating ground water quality improvement/ remediation of contamination in the country, as given below:

- i. Government of India launched Jal Shakti Abhiyan (JSA) in 2019, a time bound campaign with a mission mode approach intended to improve water availability including ground water conditions in the water stressed blocks of 256 districts in India. In this regard, teams of officers from Central Government along-with technical officers from Ministry of Jal Shakti were deputed to visit water stressed districts and to work in close collaboration with district level officials to undertake suitable interventions. In addition 'Jal Shakti Abhiyan – Catch the Rain' campaign was launched by Hon'ble Prime Minister of India on 22 March 2021. The improved groundwater recharge due to construction of artificial recharge structures and increased water harvesting is likely to significantly contribute towards reducing the contaminants level in the aquifer waters.
- ii. Data on ground water quality available with CGWB are being shared with concerned State Governments for taking necessary remedial measures.
- iii. CGWB constructs wells for exploration of ground water. Successful contamination-free wells are handed over to the State Governments for gainful utilization.
- iv. Under the National Aquifer Mapping Programme (NAQUIM) of CGWB, special attention is being given to the aspect of ground water quality including contamination by toxic substances such as Arsenic in ground water. Further, under NAQUIM, CGWB constructs arsenic safe exploratory wells arsenic affected parts of the States of West Bengal, Bihar and Uttar Pradesh. The arsenic safe deeper aquifer zones have been identified and wells have been

constructed tapping the arsenic safe deeper aquifers using innovative cement sealing technique. So far, 513 exploratory wells tapping arsenic safe aquifers have been constructed under NAQUIM programme including 40 in Bihar, 188 in West Bengal and 285 in Uttar Pradesh. In addition, the innovative cement sealing technique of CGWB has been shared with the State agencies to utilize to construct arsenic free wells.

- v. Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti has issued guidelines for control and regulation of groundwater extraction with pan-India applicability notified on 24 September 2020. The guidelines include clauses on 'Measures to be adopted to ensure prevention from pollution in the plant premises of polluting industries/projects'. Further, as per the guidelines, in case of coal and other base metal mining the project proponent shall use the advance dewatering technology (by construction of series of dewatering abstraction structures) to avoid contamination of surface water. In addition to this, all mining units shall also monitor the water quality of mine seepage and mine discharge through NABL accredited/ Govt. approved laboratories and the same shall be submitted at the time of self-compliance.
- vi. Further, the groundwater pollution owes its origin to contamination of surface water sources also which upon percolation pollute the groundwater aquifer system and therefore, various efforts have been made in the country to address this by installing Sewage Treatment Plants, Effluent Treatment Plants and better system of sewage networks etc. However, the adverse effects of the groundwater pollution can be addressed to a large extent if safe water is made available to public. With this aim, central Government in partnership with States, is implementing Jal Jeevan Mission (JJM) since August, 2019 to provide potable tap water supply of prescribed quality to every rural household in the country by 2024.
- vii. Further, while allocating the funds to States/ UTs in a particular financial year, 10% weightage is given to the population residing in habitations affected by chemical contaminants including Arsenic and Fluoride, as on 31st March of the preceding financial year. Since, planning, implementation and commissioning of piped water supply schemes based on a safe water source likely to take time, purely as an interim measure, States/ UTs have been advised to install community water purification plants (CWPPs) in such habitations, to provide potable water to every household at the rate of 8–10 litre per capita per day (lpcd) to meet their drinking and cooking requirements.
- viii. The Department of Drinking Water and Sanitation (DoDW&S) had launched a National Water Quality Sub-Mission (NWQSM) on 22<sup>nd</sup> March, 2017 as a part of National Rural Drinking Water Programme (NRDWP), which has now been subsumed under Jal Jeevan Mission, to provide safe drinking water to 27,544 arsenic/fluoride affected rural habitations in the country.
- ix. Under Atal Mission for Rejuvenation and Urban Transformation (AMRUT) launched on 25th June, 2015 in selected 500 cities with focus on development of urban infrastructure in various sectors including water supply, States/UTs have the option to take projects on special water supply arrangements for difficult areas, hill and coastal cities, including those having water quality problems with Arsenic, Fluoride etc.
- x. Government of India has launched AMRUT 2.0 on 01 October, 2021 for the period of 05 years (FY 2021-22 to 2025-26), with the objective of providing universal coverage of water supply through functional household tap connections

in all statutory towns in the country. AMRUT 2.0 focuses on making cities' water secure through recycle/reuse of treated sewage, rejuvenation of water bodies and water conservation."

37. Detailing the efforts being taken in the Arsenic affected areas, the representative of the Ministry during the course of evidence stated as under:-

"In areas where there is arsenic issue, we have developed a technology wherein the well drilled can be sealed against those aquifers that are polluting. So, sealing those well aquifers, which are polluting the ground water, deeper aquifers are being tapped and this technology is being used by West Bengal, Bihar, UP, etc."

38. Audit revealed that broadly, the quality of ground water is affected by Anthropogenic (generated by human activity) and Geogenic (generated by geological process) activities. The factors affecting ground water quality were available in respect of 11 States/UTs. Audit also noticed that most of the States/UTs that conducted assessment of change in quality of ground water reported excessive use of fertilizers and pesticides, disposal of industrial and municipal waste and sea water intrusion as factors for deterioration of ground water quality.

39. Audit observed that the number of cases of fluorosis was significant in Andhra Pradesh, West Bengal and Madhya Pradesh. West Bengal was also affected by the problem of Arsenic poisoning. DoWR, RD&GR stated (September 2020) that monitoring of ground water quality was done every year and the data shared through the India WRIS portal. Audit however, noticed (October 2020) that the WRIS portal contained data as of 2015-16 only.

40. To a specific query regarding the action taken to assess the factors affecting ground water quality in the States/UTs where no such assessment has been done, the Ministry in a written reply stated as under:-

"Central Ground Water Board generates ground water quality data on a regional scale during various scientific studies and ground water quality monitoring throughout the country. These studies indicate the occurrence of contaminants such as Flouride, Arsenic, Nitrate, Iron and Heavy Metals beyond permissible limits (as per BIS) for human consumption in isolated pockets in various States / UTs. The ground water contamination reported by CGWB is mostly geogenic in nature and does not show significant change over the years. However, nitrate contamination is mostly anthropogenic and its spread has been noticed in some areas, particularly areas adjoining habitations. Nitrate contamination can also be caused by excessive use of fertilizers".

41. As regards the methodology adopted and the efforts being taken by CGWB for monitoring the Ground Water Quality, representative of the Ministry during the course of examination explained through a Power Point Presentation as under:-

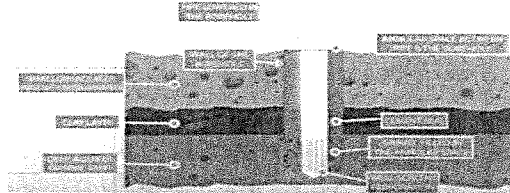
## Management of GW (A4) - Ground Water Quality Monitoring

- CGWB generates GW quality data on a regional scale which is shared with states/UTs.
- Samples are collected and analysed once a year throughout the country.
- Major contaminants reported:

Fluoride (above 1.5 mg/l)	Nitrate (above 45 mg/l)	Arsenic (above 0.01 mg/l)	Iron (above 1mg/l )	Salinity (EC >3000 micro s/cm)
<b>7% Samples</b> Beyond Permission Limits	<b>21% Samples</b> Beyond Permission Limits	<b>2% Samples</b> Beyond Permission Limits	<b>9% Samples</b> Beyond Permission Limits	<b>6.45% Samples</b> Beyond Permission Limits
<b>Distribution</b>	<b>Distribution</b>	<b>Distribution</b>	<b>Distribution</b>	<b>Distribution</b>
Parts of 370 districts in 23 states & UTs	Parts of 423 districts in 23 states & UTs	Parts of 152 districts in 21 states & UTs	Parts of 341 districts in 27 states & UTs	Parts of 248 districts in 18 states & UTs
<b>Major Sources</b>	<b>Major Sources</b>	<b>Major Sources</b>	<b>Major Sources</b>	<b>Major Sources</b>
Fluoride bearing minerals, in the aquifer matrix.	Anthropogenic activities like Dumping of wastes, use of fertilizers etc.	Arsenic in aquifer matrix	Iron in aquifer matrix	Aquifer matrix, water logging and Sea water Ingress

## Management of GW (A5) - Ground Water Quality Remediation

- ❖ As a part of NAQUIM studies, CGWB has demonstrated the Cement sealing technology for construction of wells tapping Arsenic safe aquifers in Arsenic affected areas. States are also replicating the technique.



- ❖ Jal Jeevan Mission (JJM) is being implemented in which 10 % weightage for funds allocation in a year is given to quality affected habitations.
- ❖ National Water Quality Sub Mission was launched to cater for 27544 arsenic/Fluoride affected habitations.
- ❖ As a part of the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) option to take projects including those having water quality issues.
- ❖ Guidelines for control and regulation of groundwater extraction also has provisions for prevention of pollution.
- ❖ Promoting water conservation and artificial recharge, which also reduces the contaminants level.
- ❖ Water being a State subject, State Govts take initiatives for treatment or providing water from alternate contaminant safe sources.

### (e) Model Bill on Ground Water and Legislative framework in States/UTs

42. Audit noticed that to enable the States to enact Ground Water Legislation, DoWR, RD&GR circulated (2005) a Model Bill to all the States/UTs for regulation and development of ground water. However, the Model Bill was under review (December 2019) as per the suggestions of NITI Aayog. As of December 2019, 19 States/UTs had enacted legislation for management of ground water. Audit observed that the lack of clear guidelines from the Department impacted the legislations implemented by the States.

43. When asked, why no proper guidelines were issued by the Department regarding legislation for management of ground water, the Ministry in a written reply as under:-

"Ministry of Jal Shakti had earlier circulated Model Bill - 2005 for Regulation and Control of Ground Water Development to all the States. So far 19 States/ UTs have enacted Ground Water Act. The matter is being pursued with the States/UTs. Further, the revised Model bill on Ground Water has been finalized by the Department which is being clubbed with other Model Bills (of the Department) to have a holistic comprehensive Model Bill on water management (encompassing all matters of water falling in the domain of States/UTs) in the country. Further, Ministry of Jal Shakti has issued new guidelines on 24.09.2020 for regulation and control of ground water extraction by industrial, infrastructure and mining projects. These guidelines have pan-India applicability."

44. As regards the challenges being faced by the Ministry *vis-a-vis* centre-state co-ordination with regard to policy framework, the Ministry in a written reply informed as under:-

"Water being the State subject, the actual implementation of recharge works are to be taken up by the States/UTs. The Central Government has brought out advisories/model bills etc from time to time for the States/UTs; the groundwater related policy initiatives including formulating/promulgating legal framework in the States are undertaken by the State Governments. 19 States/UTs have implemented the groundwater Model Bill circulated earlier by the Ministry. Further, the groundwater regulation guidelines dated 24 Sep 2020 issued by the Ministry are in implementation stage in certain States/UTs."

45. In this regard, while deposing before the Committee, the representative of the Ministry further stated as under:-

".....water is essentially a State subject. Our model Bill was supposed to be a kind of a beacon, a kind of a suggestion to the States that in what way they should legislate. But it is up to the States to decide. They can make certain variations as per their ground conditions and their own imperatives."

46. When asked about the response of the States to the guidelines for control regulation of groundwater extraction which was notified by the Ministry on 24th September, 2020 and the mechanism in place to ensure that these guidelines are followed by the States, the Ministry in a written reply stated as under:-

"States that had their own Groundwater Acts and/or had been regulating groundwater prior to the 24 Sep 2020 notification are being pursued to adopt/ follow the Central guidelines. States are also being requested to make the process of NOC issuance online, in line with the NOCAP Portal of CGWA. Secretary, DoWR, RD & GR has written D.O. letters to Chief Secretaries of respective States in this regard. Matter is being pursued regularly through meetings by the CGWA with State authorities. Further, States which are in the process of enacting Groundwater Act and constituting State Ground Water Authorities are being pursued to adopt /

follow the Central guidelines. State of Haryana has adopted guidelines, whereas, the States of Punjab and UP are in the process of adopting the guidelines."

47. In a detailed Note on the feasibility of Parliament formulating legislation on the subject matter of "Ground Water Management" with the concurrence of State Governments the Ministry stated as under:-

**"Brief Statement in favour of legislations by States on groundwater subject**

1. ....

2. The matter was examined in detail in the Ministry. In this regard, Ministry referred to various provisions of the Constitution of India and recommendations of various Commissions formed by Government of India time to time in this regard.

3. **Provisions of the Constitution:** Various provisions regarding powers to legislate on various matters have been mentioned in the Constitution of India. Article 246 clearly brings out this aspect which is reproduced as under:

**Article 246, Clause (1)** - Parliament has exclusive power to make laws with respect to any of the matters enumerated in List I in the Seventh Schedule (referred to as the "Union List").

**Article 246, Clause (2)** - Notwithstanding anything in clause (3), Parliament, and, subject to clause (1), the Legislature of any State also, have power to make laws with respect to any of the matters enumerated in List III in the Seventh Schedule (referred to as the "Concurrent List").

**Article 246, Clause (3)** - Subject to clauses (1) and (2), the Legislature of any State has exclusive power to make laws for such State or any part thereof with respect to any of the matters enumerated in List II in the Seventh Schedule (referred to as the "State List").

**State List (List II) :-**

Entry no. – 17 of "State List" (List-II) pertains to Water subject and states the following:

"Water, that is to say, water supplies, irrigation and canals, drainage and embankments, water storage and water power subject to the provisions of entry 56 of List I".

**Union List (List I):-**

Entry 56 of Union List (List I) pertains to Water subject and states the following:

"Regulation and development of inter-State rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest".

4. Further the matter on legislation by Parliament or by State Legislatures on Water subject were examined by various committees in the past. The relevant recommendations/suggestions of Sarkaria Commission and Panchhi Committee in this regard are as under:

**Sarkaria Commission:** With a view to reviewing the working of the existing arrangements between the Union and the States in the changed socio-economic scenario, the Government of India vide Ministry of Home Affairs Notification No.IV/11017/1/83-CSR dated June 9, 1983 constituted a Commission under the Chairmanship of Justice R.S. Sarkaria with Shri B. Sivaraman and Dr. S.R. Sen as its members. The Commission submitted its recommendations in January 1988. The relevant recommendations are as under: -

***Excerpt from Para 17.04.02 - Management of water resources for the benefit of people of a State is a matter of vital concern to that State. The present situation is more a case of non-use of a given power by the Union than one of want of the same. We are, therefore, of the view that the existing arrangements which allow the States competence in regard to matters in entry 17, List II—subject, however, to Union's intervention when found necessary in public interest only in inter-State river and river valleys—is the best possible method of distributing power between the Union and the States with respect to this highly sensitive and difficult subject. We are, therefore, unable to support the suggestion that 'Water' should be made a 'Union subject'.***

**Punchhi Committee:** The Government of India constituted a Commission on Centre-State Relations under the chairmanship of Justice Madan Mohan Punchhi, former Chief Justice of India on 27th April 2007 to look into the new issues of Centre-State relations keeping in view the changes that have taken place in the polity and economy of India. The Commission examined and reviewed the working of the existing arrangements between the Union and States, various pronouncements of the Courts in regard to powers, functions and responsibilities in all spheres including legislative relations, administrative relations, role of governors, emergency provisions, financial relations, economic and social planning, Panchayati Raj institutions, sharing of resources including inter-state river water etc. The Commission made 273 recommendations in its seven volume report presented to Government on 30 March 2010.

The Commission deliberated on Water in Chapter II of volume-IV of the report and relevant recommendations are as under:

***Para 2.6.03 - A view has been expressed that perhaps such a harmony can be achieved by shifting 'water' to the Concurrent List or by "nationalization" of inter State rivers. We do not see merit in these proposals. Items in the Concurrent List can be acted upon both by the Centre and States. The Constitutional provisions at present do not preclude this. Moreover such a shift in the case of water would lead to similar demands say in the case of "land". We are not in favour of initiating such a ripple effect in Centre-State relations. We have made recommendations on the section dealing with environment on the manner in which harmonization of all natural resources should take and the policies which***



*should guide national efforts. Moreover good governance calls for decentralization, because of the variety of local problems and solutions. This is more so in the case of water. The Constitution gives a direct responsibility to the States and through Parts IX and IXA enjoins upon them to proceed with a further set of devolutions to Local Bodies. This to our mind is the appropriate path to a decentralized action on water related matters. Nationalization connotes ownership and this is difficult to establish in the case of flowing water. What is required is regulation of water use and for that nationalization is not a requirement.*

**Para 2.6.06** - *Courts have been making a distinction between proprietary rights and the sovereign rights of the State. Exercising such sovereign rights the State can regulate the supply of water in public streams so as to utilize it to the best advantage.*

**Para 2.6.07** - *This concept was further developed into that of 'public trust' wherein it was held that the State is a trustee of all natural resources which are by nature meant for public use and enjoyment. The Supreme Court has further expanded the doctrine of public trust and given it prominence over that of eminent domain and said that natural resources (water bodies in this case) are to be managed for communities.*

5. It would be seen from the above position that subject matter of water except as mentioned in entry 56 of List I, falls within the purview of State legislatures as per the Constitutional provisions and various Commissions have recommended maintenance of status quo.

**6. Efforts of Central and State Governments for sustainable management of water resources:**

(i) Model bills like Model Groundwater Bill, Model Building Bye Laws etc have been shared with States to enact their own legislation suiting local requirements in broad conformity with the Model Bills. Various states have already legislated as per the provisions of the Model Bills. So far, 19 States/UTs have adopted and implemented the ground water legislation (viz. Andhra Pradesh, Assam, Bihar, Goa, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Odisha, Punjab, Telangana, Uttar Pradesh, West Bengal, Chandigarh, Dadra and Nagar Haveli, Jammu & Kashmir, Lakshadweep and Pondicherry).

Further, Central Ground Water Authority (CGWA) grants 'No Objection Certificates' (NOC) for ground water abstraction in 20 States/UTs as per the guidelines issued on 24.09.2020. States/UTs where the regulation being done by CGWA are Rajasthan, Uttarakhand, Gujarat, Maharashtra, Madhya Pradesh, Chhattisgarh, Odisha, Sikkim, Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Bihar, Jharkhand, Ladakh, Dadar & Nagar Haveli, Daman & Diu, Andaman & Nicobar Islands. In other States/UTs regulation of ground water is carried out by the State Governments themselves as per their extant guidelines/provisions.

(ii) The role of Central Government is generally advisory in nature and necessary technical expertise are being shared with States from time to time to improve upon the water management practices. Further, National Aquifer Mapping and Management (NAQUIM) program being implemented as a part of Ground Water Management and Regulation (GWM & R) scheme, a Central Sector scheme, envisages mapping of aquifers (water bearing formations), their characterization and development of Aquifer Management Plans to facilitate sustainable management of groundwater resources in the country. Out of the nearly 25 lakh sq km area identified to be covered under NAQUIM studies, so far an area of 23.5 lakh sq km has already been covered.

Further, state level NAQUIM outputs are shared with State Ground Water Coordination Committees (SGWC) and concerned district authorities at district level. Further, Public Interaction Programs (PIP) are being organised at grassroots level and so far 1306 Public Interaction Programmes, in which nearly 90,000 persons have participated, for disseminating the tenets of the Aquifer Management Plans for the benefit of the stakeholders including farmers. In 2022-23 six workshops involving States have been planned by the CGWB.

In addition, Assessment of Dynamic Ground Water Resources of each State/UT is being carried out jointly by CGWB and State Nodal/Ground Water Department periodically. The estimation for the year 2022 has been compiled by CGWB and is being shared with States/UTs for suitable interventions. Further, the Ministry of Jal Shakti has decided to carry out the Ground Water Resource Assessment annually from 2022 onwards for initiating timely interactions by all stakeholders for sustainable groundwater management.

(iii) Further, Central Government is implementing various schemes like Jal Jeevan Mission, MGNREGA, Atal Bhujal Yojana, PMKSY-Watershed development, AMRUT etc to supplement the efforts of the States to achieve the goals of sustainable management of this precious resources. In addition, under PMKSY-WDC a new activity named as Springshed Development have been included to take care of depleting springs in hilly areas. In addition, Central Government is implementing Jal Shakti Abhiyan (JSA) since 2019 in collaboration with States for water conservation and water harvesting in the country. Further the JSA for the year 2021 and 2022 was launched by Hon'ble Prime Minister and President respectively. As available on JSA-CTR portal, under JSA 2022, during the period from 29<sup>th</sup> March 2022 to 09<sup>th</sup> November 2022, around 7.24 lakh rainwater conservation & harvesting structures were created and around 1.20 lakh traditional water bodies were renovated in the country.

(iv) A number of States have done notable work in the field of water conservation/harvesting such as 'Mukhyamantri Jal Swavlamban Abhiyan' in Rajasthan, 'JalyuktShibar' in Maharashtra, 'SujalamSufalam Abhiyan' in Gujarat, 'Mission Kakatiya' in Telangana, NeeruChettu' in Andhra Pradesh, Jal Jeevan Hariyali in Bihar, 'Jal Hi Jeevan' in Haryana, and Kudimaramath scheme in Tamil Nadu etc.

7. Keeping in view the position outlined above, the Ministry of Jal Shakti is committed to advising, guiding and supporting the States for sustainable management of groundwater resources in the country. "

48. Giving the status of model bill circulated by DoWR, RD & GR in 2005, the Ministry informed as under:-

"Model Bill have been enacted and implemented in 19 States/ UTs (14 States and 5 UTs). Further, 13 States/ UTs (10 States and 3 UTs) have taken Initiatives for enactment of Model Bill. "

#### **(f) Human Resource constraints faced by Central agencies managing Ground Water**

49. Audit scrutiny revealed that there was some shortage of human resources in scientific and engineering categories in CGWB and its regional and divisional offices. As of March 2019, there was a vacancy of 37.51 per cent, 26.93 per cent and 26.60 per cent in the scientific, engineering and ministerial categories respectively. However, to take care of the deficiency in staffs a number of consultants/professionals have been hired by the CGWB for efficient working of the organisation.

50. In this regard when asked about the steps being taken up by CGWB/Ministry to fill the vacant positions in CGWB, the Ministry informed as under:-

"The following steps have been/are being taken by CGWB and the Department to strengthen its manpower:

1. Action has been taken/being taken to fill up direct recruitment / promotional vacancies.
2. Proposal for filling up 840 posts through Direct Recruitment / Deputation / Promotion has been initiated in consultation with UPSC / SSC and this Department.
3. To fulfill the immediate requirement of CGWB, the young professionals and consultants are also engaged on a contractual basis."

### **C. GROUND WATER REGULATION**

#### **(a) Projects granted Consent to Operate by State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs) and Projects granted license by Bureau of Indian Standards.**

51. Audit scrutiny revealed that out of a sample of 328 cases in 18 States where the Consent to Operate (CTO) granted to a project proponent included a condition which required NOC for Ground Water extraction, 253 projects (77 per cent) were operating without NOCs.

52. Audit pointed out that in 15 States for which data was made available to Audit, 3,189 Bureau of Indian Standards (BIS) licenses were issued to packaged drinking water units since 2013, of which in 2,475 cases (78 per cent), the project proponents were operating without obtaining NOCs from CGWA.

53. In this regard, when asked about the mechanism that has been put in place by CGWB to strengthen its monitoring for such projects which are operating without obtaining NOCs, the Ministry informed as under:-

"Public Notices have been issued in leading newspapers directing all groundwater user units to apply to CGWA for NOC or, at least submit NOC applications by 30.06.2022. Monthly list of NOCs issued are sent to DMs/ DCs with the advice to act against the violators/ units abstracting groundwater without the NOC. Directions are also being issued to all State Pollution Control Boards to issue CTO to all groundwater users units only after groundwater NOC has been obtained. List of all existing projects was sought from concerned State departments/ agencies such as SPCBs, Department of Industries, Indian Bureau of Mines etc. so as to find out which units have not yet obtained NOC from CGWA. Some States have provided lists and on the basis of the list random inspections are being carried out by CGWB officers. Matter is being pursued with other States. Further, because of proactive efforts of CGWA, penalty/environmental compensation to the tune of Rs 15.77 crore has already been imposed by them against 1,341 proponents who were found extracting groundwater illegally/violated NOC conditions since issue of new guidelines dated 24 Sep 2020."

**(b) Delay in processing of applications by CGWA for grant/renewal of NOC in non-notified areas**

54. Audit pointed out that during 2013-19, CGWA accorded 3,517 fresh NOCs and renewed 320 NOCs for Ground Water withdrawal to various industry, mining and infrastructure projects. As on 31 March 2019, 10,758 applications for grant of NOC and 144 applications for renewal were pending.

55. When asked about the reasons for pendency in processing applications, the Ministry explained as under:-

"The pendency as on 31.03.2019 was owing to certain concerns/observations raised by Hon'ble NGT in respect of over-exploited, critical and semi-critical areas. Therefore, only the applications falling in safe category were being cleared by the CGWA. However, after notification of new guidelines w.e.f. 24.09.2020, all pendency has been cleared."

56. Regarding the present status of all pending applications for NOCs the Ministry had informed that 1,210 NOC applications are pending with CGWA as on 01.05.2022.

57. To a specific query regarding the steps taken by CGWA to expeditiously process all applications for grant/renewal of NOC, the Ministry stated as under:-

"CGWA has fixed timelines for processing of NOC application at each stage. Currently, total time stipulated for issuance of NOC is 45 days (maximum) from date of submission of application which is being monitored by them very closely. The NOC portal (NOCAP portal) has been revamped for submission of NOC applications by the project proponents and issue of all NOCs by the CGWA through online mode. Further, the powers of issue of NOCs have been decentralized among field functionaries to have faster processing/issue of NOCs. In addition, to standardize the process of NOC issuance and to cut the discretionary powers of officers, a booklet on Standard Operating Procedure (SoP) has been issued by the CGWA which is updated time to time."

**(c) Non-receipt of applications for renewal on expiry of NOC**

58. The Audit pointed out that in 474 cases, renewal of NOC was due during 2013-18 but the project proponents did not apply for renewal. CGWA did not take any action under section 15 of the Environment (Protection) Act, 1986 against these project proponents. Thus, even after expiry of the NOC, existing industries/projects continued to draw Ground Water without any regulation.

59. While enumerating the reasons as to why no action was taken by CGWA against those project proponents who were extracting Ground Water without renewal of NOC, the Ministry stated as under :-

"Prior to April, 2015, there was no online system for NOC application processing and all the NOCs were being issued off-line. Record of such NOCs, therefore, was not available online and it was difficult to manually keep track of all the NOCs getting expired though all efforts were made by the CGWA in this direction. Further, the inspection power of visiting industries/project proponents were vested with handful staffs/officers of CGWA which has now been widened by allowing this power to be delegated to other CGWB officers, DMs/DCs etc which has resulted into better implementation of regulation measures."

60. On being asked whether any action against such project proponents is being taken, the Ministry stated as under:-

"CGWA is issuing notices to projects whose renewal is due but have not applied for same. Environmental compensation shall be levied from such projects for illegal withdrawal of groundwater as per extant guidelines. Post 24.09.2020 (notification of new guidelines), 3200 notices have been issued to various project proponents for not complying to ground water regulatory conditions and action shall be taken based on their response and as per extant guidelines. Further, penalty/environmental compensation to the tune of Rs 15.77 crore has already been imposed against 1,341 proponents who were found extracting groundwater illegally/violated NOC conditions since issue of new guidelines dated 24 Sep 2020.

61. When asked to explain the current procedure for issuing NOCs and ensuring timely renewal of expired NOCs and how CGWA is renewing NOCs of the applicants whose NOCs have expired and are not traceable, the Ministry informed as under:-

- a) Entire NOC processing is online. CGWA has its own NOC Application Processing (NOCAP) portal <https://www.cgwa-noc.gov.in>. Project Proponents (PP) have to apply online. The application is processed through various levels as per quantum of groundwater extraction applied.
- b) For faster processing of applications, the power has been decentralized based on the quantum of extraction.
- c) Timelines for processing has been fixed as per the quantum/ requirement of documents. Maximum time limit has been fixed as 45 days, provided the PP has submitted the application complete in all respect.
- d) In order to ensure timely renewal of expired NOCs, auto-generated messages are sent on registered e-mail Id and Mobile Number of PP in advance, intimating the expiry of NOC and requesting to apply to renewal timely.
- e) List of NOCs issued are sent to concerned DM/ DC who have been appointed as Authorised Officer by CGWA to ensure compliance and take action against violations.
- f) CGWA also issues public notices through newspapers etc time to time urging the groundwater users without valid NOC to apply on NOCAP. Also, as stated earlier, DM/ DC have been appointed as Authorized Officers to ensure compliance, which includes timely application for renewal before expiry of NOC. In case of NOCs issued earlier without validity date, Public Notice was issued by CGWA on 06.10.2017 asking such PPs to apply afresh, failing which existing NOC will be considered as cancelled.

**(d) Post NOC monitoring by CGWA and Authorised officers**

62. Audit pointed out that there were numerous cases in which conditions stipulated in the NOCs were violated. Despite the widespread violations, CGWA issued (2013-18) show cause notices to only 99 project proponents. During joint field visits to the industries/project sites (other than individual households) for verification of compliance with conditions laid out in NOCs, widespread non-compliance of conditions mentioned in the NOC was noticed.

63. When asked to provide the details on the number of cases in which conditions stipulated in the NOCs were violated, the Ministry informed as under:-

"There are 137 such cases in which conditions stipulated in the NOCs were violated."

64. Regarding the reasons for issuing show cause notice issued only to 99 projects proponents, the Ministry stated as under:-

"Prior to April, 2015, there was no online system for NOC application processing and all the NOCs were being issued off-line. Record of such NOCs, therefore, was not available online and it was difficult to manually keep track of all issued NOCs and their expiry dates."

65. When asked about the action being contemplated against project proponents violating the conditions stipulated in the NOCs, the Ministry informed as under:-

"NOC is renewed only after the proponents have complied with all the conditions specified in the previous NOC including installation of piezometers, data on water level etc. In the previous guidelines (2012 and 2015), there was no provision for imposition of penalty for violation/ non-compliance of NOC conditions. However, penalty is being levied towards non-compliance of NOC conditions at the time of renewal as per provisions of Environment Protection Act, 1986 and notified guidelines 24.09.2020."

66. Regarding the measures being taken by CGWB to obviate occurrence of such non-compliance, the Ministry informed as under:-

"In the new guidelines notified w.e.f. 24.09.2020, provision for penalty has been kept for violation of NOC conditions and around 3,200 show cause notices/notices have been issued since the new guidelines came into effect. Since the new guidelines came into effect, EC/ Penalty has been imposed on 907 units including penalty for late submission. Mobile App has been developed to enable project proponents to submit self-compliance with the facility for field verification by CGWB officers. In pursuance to directions of Hon'ble NGT, CGWA, vide Order dated 23.10.2017, appointed the concerned DM/DC as Authorized Officers for enforcement of conditions in NOC and to initiate action against the violations observed. "

67. On the issue of unauthorized extraction of water by industries, the representative of the Ministry, during the course of evidence, stated as under:-

"Our effort will be to work more closely with the States to improve enforcement. It is a big issue to suddenly criminalise it because industrial activity also has to go on but it has to go on lawfully. They have to comply with the water norms."

68. In this regard, Representative of the Ministry in a Power Point Presentation furnished the following updated information:-

## **Ground Water Regulation (B1) – Proponents working without NOC & Post NOC monitoring.**

- ❖ Public Notices have been issued in leading newspapers to apply for NOC by 30.06.2022.
- ❖ Monthly list of NOCs issued are sent to DMs/ DCs for suitable action.
- ❖ Directions issued to all State Pollution Control Boards to issue CTO only after groundwater NOC has been obtained.
- ❖ Inspection and compliance monitoring is being carried out by CGWB/State/Revenue officers of units without valid NOC (Authorization Issued).
- ❖ The proposal for strengthening of CGWA is under advanced stage.
- ❖ EC are levied for illegal withdrawal of groundwater as per Regulation guidelines.
- ❖ Post notification of new guidelines, 3,200 notices have been issued to various project proponents.
- ❖ Proactive efforts of CGWA have resulted in imposition of penalty/ environmental compensation to the tune of Rs 28 crore on units extracting groundwater illegally or violating NOC conditions.

### **D. IMPLEMENTATION OF SCHEMES ON GROUND WATER MANAGEMENT AND REGULATION (GWMR)**

69. As per the Cabinet Committee on Economic Affairs (CCEA) note (June 2013), the scheme "Ground Water Management and Regulation" (GWMR) had been proposed for aquifer mapping and effective management of ground water with focus on vulnerable areas. GWMR scheme was a Central Sector Scheme of DoWR, RD&GR during the XII plan (2012-17) with an estimated cost of ` 3,319 crore to be implemented by Central Ground Water Board (CGWB). The Scheme had four components: (a) National Project on Aquifer Management (NAQUIM), (b) Participatory Ground Water Management (PGWM), (c) Technological up-gradation and (d) Ground Water Monitoring, Assessment, Regulation, Publication, Seminars, Awards, technical assistance to States and spill over work of the project of Artificial Recharge & Exploration. The scheme was recommended by the Expenditure and Finance Committee (EFC) in May 2013 and approved (August 2013) by the CCEA.

70. The scheme envisaged Aquifer mapping for an accurate and comprehensive micro-level picture of ground water in different hydro-geological settings of India by using modern techniques like heliborne geophysical surveys, Geographic Information System (GIS) based thematic maps, ground water modelling and real time digital water



level monitoring. The scheme also sought for PGWM through collaborative approach, involving Central and State organisations, research institutes, Panchayati Raj Institutions (PRIs), Non-Governmental Organisations (NGOs) and local community to enable the community and stake holders to monitor and manage ground water themselves.

71. The broad objectives of the GWMR scheme (2012-17) were as under:

- i. Aquifer mapping for delineation of aquifer disposition in three dimension along with their characterisation on 1:50,000 scale in 8.89 lakh sq.km and further detailing up to 1:10,000 scale in some of the vulnerable (Over-exploited, Critical, Semi-critical) areas. Prior to this, the mapping had been done (before May 2013) at a scale of 1:250,000 and in two dimension scale.
- ii. Formulation of Aquifer Management Plan to quantify water availability and water quality in various aquifers for facilitating sustainable management of ground water resources at regional and local level through participatory management approach.
- iii. Capacity building of functionaries of PRIs, local community and grass root workers.
- iv. Up-gradation of technological capabilities and infrastructure of the CGWB to align with proposed aquifer mapping and participatory management of ground water approach.
- v. Regulate and control ground water development.

72. The EFC approved (March 2018) continuation of the scheme for 2017-20 at an estimated cost of ₹ 992 crore. However, PGWM62, which was one of the components of GWMR scheme during the XII Plan Period was dropped from the scheme. Activities to be carried out during 2017-2020 under GWMR scheme were (a) National Aquifer Mapping and Management Programme; (b) Ground Water Monitoring, Resource Assessment, Regulation, Information Dissemination, etc. including Workshops, Seminars, Technical assistance to State and Central Organisations, etc.; and (e) Strengthening of infrastructure for technological up-gradation (Machinery & Equipment) through procurement of Hydro-geological, Geophysical and Chemical equipment, Scientific Software, Computers, Drilling machines, Motor Vehicles and ancillary equipment.

73. The Ministry further stated as under:

"The activities under the 'Ground Water Management and Regulation Scheme are of continuous nature. The Scheme has been approved for continuation for the next five years (2021-26) with a total outlay of Rs 997 crore".

#### **(a) Financial performance of GWMRS**

74. The Audit pointed out that the approved outlay for the Scheme 'Ground Water Management and Regulation (GWMR)' was 4,050.66 crore during 2012-19 against

which budget allocations were 2,349.48 crore, Against the budget allocation of 2,349.48 crore, the actual expenditure under the Scheme was Rs 1,109.73 crore during 2012-19.

75. When asked about the measures taken up to allocate funds to CGWB as per sanctioned outlays and ensure timely utilisation of funds released to it, the Ministry informed as under:-

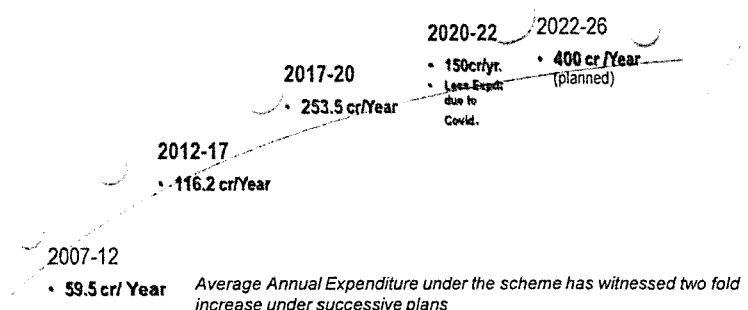
"CGWB is now closely monitoring the tendering and procurement activities and also engaged a Project Management Consultant (PMC) for tendering & execution activities which has resulted in improved utilization of funds. Above measures have resulted in improved average annual expenditure from Rs. 116 crore during 2012-17, to Rs. 220 crore during 2017-21".

76. When asked to explain in detail the monitoring system for the tendering and procurement activities, the Ministry replied as under:-

"There is a dedicated procurement cell in the Central Head Quarters of CGWB i.e. Bhujal Bhawan, Faridabad, which monitors the tendering and procurement activities. In addition to this, the progress in this respect is also periodically monitored at the level of Department of Water Resources, River Development and Ganga Rejuvenation. To ensure efficient utilization of the sanctioned amount, a Project Management Consultant (PMC) has been engaged for tendering & execution activities."

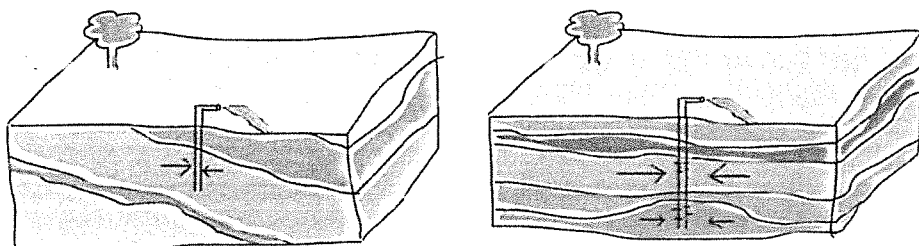
77. Regarding the Financial performance of GWMRS during the period 2007-12 to 2022-26, the Ministry during the evidence, in a Power Point Presentation, informed the Committee as under:-

### GWM&R Scheme (C1) – Financial performance



**(b) Targets of aquifer mapping and achievements and incomplete aquifer mapping reports**

- **Aquifers are natural geological units that can hold and transmit water.**



- **There are two broad groups of aquifer systems**
  - **Unconsolidated Formations or soft rock formations occupy nearly 30 % of the country and have high ground water potential.**
  - **Consolidated/Semi-consolidated Formations or hard rock formations occupy nearly 70% of the country. They have moderate to low ground water potential.**

78. Audit had pointed out that an area of 24.8 lakh sq. km was identified for Aquifer Mapping in the country. CGWB covered an area of 13 lakh sq. km. (52 per cent) as of September 2020. Further, Aquifer Mapping Reports for only 6.5 lakh sq. km. were finalized.

79. When asked about the action taken to ensure coverage of targeted area of 24.8 lakh sq.km and finalise all the remaining Aquifer Mapping Reports, the Ministry replied as under:-

"Total geographical area of the country is around 33 lakh sq km, of which 24.8 lakh sq km was identified to be covered under the NAQUIM studies. As of now (31st March 2022) 21 lakh sq km has already been covered and the targets set for coverage has been achieved. The entire area identified for NAQUIM studies is targeted to be covered by 31st March 2023. As regards reports of NAQUIM studies, against an area of 16.33 lakh sq km covered till 31st March 2021, reports in respect of 14 lakh sq km have been issued as on date. The delay in compilation of the reports can be attributed to lack of adequate manpower and deployment of concerned officers in additional activities like sharing of outputs with District Authorities, Public Interaction Programmes etc. During the year 2021-22 an additional area of 4.8 lakh sq km has been covered, reports for which will be issued during the current year. Earnest attempts are being made to issue reports in respect of the entire area covered as on 31st March 2022, by September, 2022."

80. When asked about the current status of finalisation of Aquifer Mapping Reports, the Ministry informed as under:-

"Against an area of 16.33 lakh sq km covered till 31<sup>st</sup> March 2021, reports in respect of 14 lakh sq km have been issued as on date. The delay in compilation of the reports can be attributed to deployment of concerned officers in multiple activities like sharing of outputs with District Authorities and Public Interaction Programmes etc.). Earnest attempts are being made to issue reports in respect of the entire area covered as on 31<sup>st</sup> March 2022, which is nearly 21 lakh sq km, by September 2022. The steps taken in this regard include deploying more number of officers to the regional offices where such requirements are there. The progress is being reviewed at regular intervals at Central Head Quarters level."

81. Elaborating on the efforts made by the Ministry towards aquifer Mapping Programme, the representative of the Ministry while deposing before the Committee stated as under :-

"Sir, as suggested by the C&AG team, we are expediting the completion of the national aquifer mapping programme. We will be completing all the activities by 2023. To take up the activity at finer scale, we have taken up the heli-borne survey in parts of Gujarat, Rajasthan, Haryana and Punjab. 4,00,000 sq. kms. will be covered. Under this survey, a loop is attached to the helicopter, and that picks up the signal from the earth, and for that, we get the information up to 300 metres."

### **(c) Non preparation of Ground Water Models**

82. Audit observed that ground water modelling work undertaken by CGWB was not completed as scheduled. As such, CGWB could not provide a tool to estimate ground water availability for various water use strategies and to determine the cumulative effects of increased water use and drought conditions. In this regard, DoWR, RD&GR stated (September 2020) that ground water modelling for ~3 lakh sq. km was expected to be completed by 2022.

83. With regard to the current status of ground water modelling, the Ministry informed as under:-

"So far ground water modeling for an area of 4.5 lakh sq km has been completed. Of the said 4.5 lakh sq km, ground water modeling for 2.5 lakh sq km has been carried out through in-house resources and the remaining has been carried out in collaboration with IIT, Kanpur and IISC, Bengaluru."

84. While elaborating the steps being undertaken to ensure completion of ground water modelling in a time bound manner, the Ministry informed as under:-

"In order to ensure timely completion of groundwater modeling studies, four regional hubs at North (CGWB, Faridabad), South (CGWB, South Eastern Coastal Region, Chennai), East (CGWB, South Eastern Region, Bhubaneswar) & West (CGWB, West Central Region, Ahmadabad) for coordinating the modeling studies have been created. Eight mentors have been identified, two each in the 04 regional hubs for assisting and coordinating the modeling studies. Fortnightly groundwater modeling talk series have been initiated with first fortnight talk being delivered by experts in groundwater modeling and the second fortnight talk being delivered from internal resources."

#### **(d) Dissemination of NAQUIM outputs**

##### **(i) Designing of web-based system**

85. Audit pointed out that though CGWB had published aquifer mapping reports, a web-based system for easy dissemination of the information on the aquifer mapping was not designed, as envisaged.

86. When asked about devising of any mechanism for disseminating aquifer mapping information on the web, for easy understanding of the general masses, the Ministry informed as under:-

"NAQUIM reports are being disseminated through CGWB website. Further, a separate web-portal Aquifer Information and Management System (AIMS) has been developed for easy dissemination of information on aquifer mapping. The AIMS portal is being further upgraded by CGWB to have easier dissemination of aquifer related information to the public at block levels. Further, groundwater levels, water quality information can also be accessed through India-WRIS portal maintained by National Water Informatics Centre."

##### **(ii) Action by State Governments on Aquifer mapping reports**

87. Audit observed that of the 201 reports included in the programme, Aquifer mapping reports of only 168 districts were shared with District Administration till November 2019. Many States did not take action on the recommendations made by CGWB in the aquifer mapping reports due to constraints such as map scale being too small to locate the areas, non-receipt of funds from CGWB or Central Government to implement the reports in the field, etc.

88. When the Committee sought to know the status regarding Aquifer mapping reports which have been finalised, the Ministry informed as under:-

"Against an area of 16.33 lakh sq km covered till 31<sup>st</sup> March 2021, reports in respect of 14 lakh sq km have been issued as on date. Earnest attempts are being made to issue reports in respect of the entire area covered as on 31<sup>st</sup> March 2022, which is nearly 21 lakh sq km by September 2022. The steps taken in this regard include deploying more number of officers to the regional offices where such requirements are there. The progress is being reviewed at regular intervals at Central Head Quarters level."

89. When asked whether all these Aquifer mapping reports have been shared with the District Administration, the Ministry informed as under:-

"To ensure better utilization of NAQUIM outputs, District wise findings are shared with the District Administration. Sharing of NAQUIM outputs with District Authorities, as a new activity was initiated in the year 2018. So far, NAQUIM studies are complete in parts of 538 districts and outputs in respect of 385

districts have already been shared. Ernest efforts are being made to share the NAQUIM outputs in respect of all the covered districts with the district authorities during the current year 2022-23."

90. To a specific query regarding the number of States that had not taken action on the recommendation made by CGWB on Aquifer mapping reports , the Ministry informed as under:-

"The NAQUIM outputs shared with the State Governments include information about aquifers in the States, ground water level, ground water quality, ground water resource availability etc along with a management plan. The information contained in the report has potential for use by many agencies like water resources, agriculture, irrigation etc. States of Andhra Pradesh, Delhi, Haryana, Kerala, Madhya Pradesh, Rajasthan, Tamil Nadu, Tripura and Uttar Pradesh are using the information for ground water management planning and implementation. NAQUIM outputs are also being used in the seven States (Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh) where Atal Bhujal Yojana is being implemented."

91. In this regard, when further asked about the mechanism by which the Ministry was engaging with the States to impress upon them to take requisite action on Aquifer Management Reports and to help the states in difficulties related to funding/technical aspects, the Ministry informed as under:-

"The NAQUIM outputs are shared with the State Governments through the State Ground Water Coordination Committees (SGWCC) which are headed by the concerned Principal Secretaries of the respective States. From 2018, as per the directions of the Ministry, CGWB has started sharing the NAQUIM recommendations to the District Authorities and so far outputs in respect of 385 districts are already shared with the District authorities. Outputs are also being shared with other central agencies for their effective utilisation. CGWB also provides technical assistance to the State Governments, as and when requested for such assistance. As regards funding, Ministry of Jal Shakti as a part of the ground water component of the PMKSY-HKPP provides financial assistance for construction of irrigation wells in areas that are identified as safe and where additional development of ground water is possible. Ministry of Jal Shakti as a part of Atal Bhujal Yojana provides technical assistance and financial support for ground water management in identified water stressed areas."

92. When asked whether the Ministry was sending any alerts to areas with depleted water tables based on information available on AIMS, the Ministry informed as under:-

"As of now there is no such provision in AIMS. However, district-wise findings of NAQUIM studies including management plans are being shared with District Administration (DM/DC) highlighting the local groundwater issues and remedial measures."

93. When asked whether any mechanism has been developed so that district/block authorities may take immediate/suo-moto action based on the information available on the AIMS, the Ministry informed as under:-

"The NAQUIM outputs shared with the State Governments include information about aquifers in the States, ground water level, ground water quality, ground water resource availability etc along with a management plan. The information contained in the report has potential for use by many agencies like water resources, agriculture, irrigation etc. States of Andhra Pradesh, Delhi, Haryana, Kerala, Madhya Pradesh, Rajasthan, Tamil Nadu, Tripura and Uttar Pradesh are using the information for ground water management planning and implementation. NAQUIM outputs are also being used in the seven States (Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh) where Atal Bhujal Yojana is being implemented. A mechanism has been put in place to share the recommendations with the State Governments. The mechanism includes sharing the information at State Level through the ground water coordination committees and at district level with the District administration. The concerned authorities in the State/District can use this information for planning and implementation of ground water management interventions."

94. While elucidating the cases of use of NAQUIM outputs by several states, the Ministry in a Power Point Presentation, during the evidence, informed as under:-

#### **GWMR Scheme (C4) – Select cases of use of NAQUIM outputs**

Type of Interventions	States
Drinking water source finding and source sustainability	Maharashtra, Jammu and Kashmir
Artificial Recharge and water conservation interventions	Chhattisgarh, Kerala, Tamil Nadu, Andhra Pradesh, Madhya Pradesh, West Bengal, Odisha
Artificial Recharge interventions in Urban Area	Bengaluru
Rejuvenation of Hot spring	Rajgir, Bihar
Safe Drinking water in Arsenic affected areas	Bihar, Uttar Pradesh and West Bengal
New areas with groundwater potential for irrigation	Assam, Nagaland
Ground Water Regulation based on NAQUIM recommendation	Tamil Nadu

#### **(e) Participatory Ground Water Management**

95. According to Audit, although an outlay of 575.38 crore was provided for the period 2013-17 under the component Participatory Ground Water Management (PGWM) in accordance with the National Water Policy 2012, no expenditure was incurred. The component was dropped from the subsequent EFC memo of 2017-20 and is now being taken up as a separate scheme on participatory ground water management through the Atal Bhujal Yojana (ABHY). However, unlike the PGWM,

ABHY will be implemented only in few selected locations in seven States, therefore, both in scale and size, the ABHY is not a replacement for PGWM which was dropped.

96. When the Committee sought to know the reasons for not implementing the component Participatory Ground Water Management (PGWM), the Ministry informed as under:-

"Participatory Ground Water Management Component as envisaged in the EFC memo involved hiring the services of a Technical Support Agency (TSA), which in turn was to deliver a set of consistent project management functions and technical services (activities, programmes, guidelines, farmer water school methodologies etc.) at State level. However, a suitable agency to serve as a TSA was not available. Deliberations at various levels to evolve a modified strategy for participatory ground water management resulted in a full fledged scheme Atal Bhujal Yojana, which was launched in 2019."

97. On being asked about the details of the seven States where ABHY is being implemented and the basis for selection of these States , the Committee informed as under:-

"Atal Bhujal Yojana is being taken up in 8,562 water stressed Gram Panchayats of 224 administrative blocks/ Talukas in 80 districts of seven States, viz. Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. It is being implemented from 01.04.2022 for a period of 5 years. States for implementation of the scheme were finalized based on several criteria including institutional preparedness, hydrogeological conditions in addition to ground water over-exploitation / water stress conditions.

98. When asked about the Ministry's plan towards achievement of ground water management at grass root level across the entire country, as envisaged by the National Water Policy (2012), the Ministry in a written reply in the year 2022 responded as under:-

"The scheme envisages active participation of the communities and panchayats in the participating States in various activities such as formation/strengthening of Water User Associations, monitoring and disseminating ground water data, water budgeting and preparation of Gram-Panchayat wise Water Security Plans (WSPs) & their implementation. The participation of women in water budgeting and water security planning exercises has been kept at least 33% in the Gram Panchayat-level Water User Associations. Mid-term review of Atal Bhujal Yojana is scheduled to be held in this year and based upon the evaluation/feedback, decision on extension of the Scheme to other areas will be taken. Further, Water being a State subject the groundwater Regulation guidelines dated 24 Sep 2020 (with Pan-India applicability) notified by the Department talks about implementation of participatory groundwater management in the country. The States/UTs are being periodically advised to work in participatory approach to achieve the objectives of sustainable groundwater management."



#### **(f) Capacity Building**

99. According to Audit, the Expert Group's Report on Benchmarking gave (December 2012) 12 recommendations relating to capacity building in CGWB. All the recommendations were accepted (August 2013) for implementation by the Review Committee. However, out of 12, no action was taken in respect of four recommendations by CGWB which include (i) Selected CGWB officers/staff should attend international conferences and present important findings.(ii) A mentorship programme should be developed between CGWB and international experts to provide one on-one training for specialized hydro-geologic techniques and applications. (iii) Attendance at scientific conferences is an especially important aspect of capacity building.(iv) CGWB should provide references on its website for self-training in the field of hydrogeology. Audit observed that in spite of these recommendations being of considerable importance for CGWB with respect to its future infrastructure and human resource requirements, CGWB failed to take action on some of the significant recommendations. The Department accepted (October 2019) that recommendations were not implemented completely. It further added that CGWB would make all efforts to implement these recommendations.

#### **(g) Schemes/Initiatives of States/UTs for management of Ground Water**

100. Audit observed deficiencies in schemes of some States. These included delay in completion of schemes, lack of analysis of ground water level data before recommending proposals for construction of tube wells (Bihar); delay in finalisation of project on Ground Water Recharge action plan (Delhi); shortfall in the activities of State Ground Water Conservation Mission, lag in achievement of targets for implementing the use of sprinkle irrigation (Uttar Pradesh), etc. Audit also highlighted that while some of the schemes implemented in the States were effective in improving the condition of ground water levels in the States, there were schemes in which the envisaged targets were not achieved and therefore, needed better control and implementation to ensure the desired results.

### **E. SUSTAINABLE DEVELOPMENT GOALS AND GROUND WATER**

101. The 193 Member States of the United Nations (UN) officially adopted a new sustainable development agenda entitled, "Transforming Our World: The 2030 Agenda for Sustainable Development" at the Sustainable Development Summit held at UN Headquarters in New York in September 2015. This agenda contains 17 Goals and 169

targets. The action for achievement of Sustainable Development Goals (SDGs) started on 1 January 2016 and these are expected to be achieved by 31 December 2030. Of these 17 goals, one goal i.e. Goal 6- 'Ensure availability and sustainable management of water and sanitation for all' is related to clean water and sanitation.

102. NITI Aayog has been entrusted with the role to co-ordinate 'Transforming our world: the 2030 Agenda for Sustainable Development' (SDGs). NITI Aayog is required to periodically collect data on SDGs and to act proactively to fructify the goals and targets quantitatively as well as by maintaining high standards of quality. Ministry of Statistics and Programme Implementation (MoSPI) undertook a parallel exercise of interaction with the Ministries to evolve indicators reflecting the SDG goals and targets. To achieve these tasks, the draft mapping of the goals and targets vis a vis the Nodal and other Ministries has been carried out in consultation with MoSPI. For Goal 6, the targets identified by NITI Aayog for DoWR, RD&GR as related to ground water are as under:-

**Target 6.4** - By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity;

**Target 6.6** - By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes;

**Target- 6.b** Support and strengthen the participation of local communities in improving water and sanitation management.(this target was not linked to a scheme by NITI Aayog)

**(a) Target 6.4 — Annual ground water withdrawal against net annual availability**

103. Audit pointed out that against the target value for percentage annual ground water withdrawal against net annual availability of 70 per cent under Target 6.4 for Goal 6 under Sustainable Development Goals issued by NITI Aayog, the national level was at 63 per cent. However, there were eight States/UTs (Chandigarh, Delhi, Haryana, Himachal Pradesh, Puducherry, Punjab, Rajasthan, Tamil Nadu) where this value was higher than the target of 70 per cent. Out of 534 districts in 22 States/UTs, 202 districts had stage of extraction ranging from 71 per cent to 385 per cent.

104. When asked about action taken by CGWB to achieve the target 6.4 in states/districts having stage of extraction more than 70 per cent, the Ministry replied as under:-

"Though water is a State subject, Central Government has taken a number of measures for conservation, management of ground water including effective

implementation of rain water harvesting in the country, which can be seen at URL:[http://jalshakti-dowr.gov.in/sites/default/files/Steps\\_to\\_control\\_water\\_depletion\\_Feb2021.pdf](http://jalshakti-dowr.gov.in/sites/default/files/Steps_to_control_water_depletion_Feb2021.pdf). Government of India launched Jal Shakti Abhiyan (JSA) for implementation of suitable interventions based on scientific inputs in 2019 in 256 water stressed districts in the country. Further, seeing the importance of sustainable management of groundwater in the country, the campaign "Jal Shakti Abhiyan: Catch the Rain" (JSA:CTR) was launched by the Hon'ble Prime Minister on 22 March 2021. The JSA : CTR campaign for the year 2022 has also been launched by Hon'ble President of India on 29 March 2022 and the progress is being closely monitored by the Ministry. Atal Bhujal Yojana (ABHY) is being implemented in the identified over-exploited and water stressed areas falling in the States of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The scheme is expected to contribute significantly towards water and food security of the participating States. CGWA has advised States/UTs to take measures to promote/adopt artificial recharge to ground water / rain water harvesting. The latest guidelines for control and regulation of groundwater extraction with pan-India applicability were notified by the Ministry on 24 September 2020. Through the guidelines, the States/UTs have been advised to promote crop rotation, crop diversification, bring suitable water pricing policy and review the free/subsidized electricity to farmers to control excessive extraction of groundwater. Further, CGWA is issuing NOC to project proponents based on groundwater conditions and as per extant guidelines in 20 States/UTs. CGWB is preparing the aquifer mapping and management plan (for groundwater) for the entire country which is likely to be completed by 31 Mar 2023. The management plans including agriculture sector (like plans for crop diversification, sprinkler system, drip irrigation etc.) are shared with the respective State governments for taking appropriate measures / implementation for sustainable groundwater management. In addition, a number of States have done notable work in the field of water conservation/harvesting such as 'Mukhyamantri Jal Swavlamban Abhiyan' in Rajasthan, 'Jalyukt Shibir' in Maharashtra, 'Sujalam Sufalam Abhiyan' in Gujarat, 'Mission Kakatiya' in Telangana, Neeru Chettu' in Andhra Pradesh, Jal Jeevan Hariyali in Bihar, 'Jal Hi Jeevan' in Haryana, 'Pani Bachao, Paisa Kamao' in Punjab and Kudimaramath scheme in Tamil Nadu etc."

**(b) Target 6.6 - By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes;**

105. Audit observed that CGWB had, as a part of its 'Ground water Management and Regulation Scheme' proposed a component of Aquifer Mapping and Preparation of Aquifer Management Plan during XII Plan (2012-17) which was to be further continued during 2017-20. Under the Aquifer Mapping, a combination of geologic, geophysical, hydro-geologic, hydrologic and water quality data are integrated to characterise the quantity, quality and distribution of ground water in aquifers. Audit pointed out that of the total identified area of 24.8 lakh sq. km. to be mapped under NAQUIM, 13 lakh sq. km. had been covered as of September 2020 but Aquifer Mapping Reports in respect of nearly 6.5 lakh sq. km. (i.e. 50 per cent of the area covered) for 29 States/ UTs only had been finalised. Audit observed that considering the fact that CGWB has not been able to prepare the maps for all the aquifers, Centre and State governments, in the absence

of these maps, may not be able to plan and implement strategies to protect these aquifers as per target. It is pertinent to mention that this target is to be achieved by the year 2020.

106. When asked about the action taken to ensure coverage of targeted area of 24.8 lakh sq.km and finalise all the remaining Aquifer Mapping Reports, the Ministry *inter-alia* replied as under:-

"Total geographical area of the country is around 33 lakh sq km, of which 24.8 lakh sq km was identified to be covered under the NAQUIM studies. As of now (31st March 2022) 21 lakh sq km has already been covered and the targets set for coverage has been achieved. The entire area identified for NAQUIM studies is targeted to be covered by 31<sup>st</sup> March 2023.

**(c) Target 6 b - Local communities' participation in water management**

107. According to Audit, the National Water Policy (2012) also envisages that declining ground water levels in over-exploited areas need to be arrested by introducing improved technologies of water use, incentivising efficient water use and encouraging community based management of aquifers. Accordingly, DoWR, RDGR had, as part of its 'Ground Water Management and Regulation Scheme' proposed a component of participatory management during XII Plan (2012-17). Participatory management was envisaged to enable the community and stake holders to monitor and manage the ground water as common pool resources themselves. This required a coordinated effort involving Government departments, research institutes, Panchayati Raj Institutions, civil society organisations and stakeholders at village level. However, no action on this component was taken by the Department. Further, in the context of extension of this scheme for 2017-20, this component, which had a pan-India scope was removed and included under another scheme Atal Bhujal Yojana, launched in December 2019, but limited to seven States only. Hence, there was delay in government initiative in respect of this target and as such, target 6 b remains unachieved in respect of ground water

108. On a specific query regarding any action taken to support and strengthen local communities in water management, the Ministry replied as under:-

"To support and strengthen local communities in water management, following actions have been initiated:

- a) The Government is implementing Atal Bhujal Yojana (Atal Jal), a Rs. 6,000 crore Central Sector Scheme with World Bank assistance, for sustainable management of ground water resources with community participation. The scheme is being taken up in select areas that include 80 districts, 224 administrative blocks and 8,565 water stressed Gram Panchayats of seven States, viz. Haryana, Gujarat,

Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh from 01.04.2020 for a period of 5 years. The scheme can be extended in other water stressed areas based on efficacy/outcomes.

- b) Water being a State subject the groundwater Regulation guidelines dated 24 Sep 2020 (with pan-India applicability) notified by the Department talks about implementation of participatory groundwater management in the country. The States/UTs are being periodically advised to work in participatory approach to achieve the objectives of sustainable groundwater management.
- c) Organising Public Interaction Programmes: Initiated in 2018, so far 1,093 programmes have been conducted in which nearly 90,000 persons participated.
- d) CGWB under the aegis of Rajiv Gandhi National Ground Water Training and Research Institute (RGNGWTRI) conducts tier III (block level) training programmes to sensitize and motivate the public to undertake water harvesting and conservation measures. Initiated in 2012, so far RGNGWTRI has conducted 510 such programmes in which more than 70,000 persons have been imparted training."

109. While informing about the steps taken towards achievement of Sustainable development Goals, the representative of the Ministry, during the course of the evidence, stated as under:-

"In addition, for attaining the SDG, various activities are being taken up by the Ministry. These include the Jal Shakti Abhiyan through which we are sensitizing the public, we are promoting cleaning and revival of the water bodies, we have taken up various programmes for demonstrative project of artificial recharge, and we are focussing more on participatory approach under Atal Jal Yojana."

110. Highlighting the efforts being undertaken to achieve SDG No. 6 regarding "clean water and sanitation for all" by 2030, the Ministry in a written reply informed as under:-

- i. "Water being a State subject, management of water resources, including providing clean water to the people is mainly the responsibility of the respective State Governments.
- ii. Since August 2019, Central Government in partnership with States is implementing Jal Jeevan Mission to make provision of potable water to every rural household through tap water connection in the country by 2024, a timeline which is well before the SDG's timeline of 2030. As on date, out of 19.22 crore rural households in the country, 9.70 crore have provision of tap water supply.
- iii. Further, provisions have also been made for the States/UTs to take up Community Water Purification Plants (CWPP) to provide 8-10 litre per capita per day of water to meet drinking and cooking needs of households residing in villages/habitations having water-quality issues and planning and implementation of piped water supply in these areas will take time, purely as an interim measure, till commissioning of regular water supply scheme for providing potable water through tap connection to every rural household.

- iv. A DO letter M-11015/124/2021-CB dated 31 March 2022 has been written by the Secretaries of Department of Health & Family Welfare, Ministry of Panchayati Raj, Department of Drinking Water & Sanitation, Ministry of Women & Child Development, Department of Agriculture and Farmers Welfare, Department of Water Resources, RD & GR, Department of Land Resources & Department of Rural Development to Chief Secretary of all States/UTs bringing out the urgent steps needed to make the villages water sufficient to meet the SDG goals.
- v. Atal Bhujal Yojana being implemented in certain water stressed areas of seven States envisages addressing four critical issues relating to sustainable ground water management, i.e. state-specific institutional frameworks for sustainable groundwater management; enhancement of groundwater recharge; improvement of water use efficiency; and strengthening of community-based institutions to foster ground water management. This scheme will have positive impact on source sustainability and thereby contribute in SDG 6 regarding "clean water and sanitation for all".
- vi. To create a long-term impact, National Mission for Clean Ganga (NMCG) is currently preparing a National Framework on the Safe Reuse of Treated Wastewater. Several State Governments such as Maharashtra, Gujarat etc. have already brought out the water reuse policy. States such as Bihar are in process of developing their policy. The medium and short-term initiatives taken by NMCG include encouraging its stakeholders to adopt a circular economy approach in the water/ waste sector.
- vii. IWRM studies are being done/ being planned by the Central Water Commission for some of the basins to undertake short term, medium term and long term initiatives. The basin-wise water availability studies have been completed in June, 2019, using latest space inputs and latest methodology."

111. When asked about the steps being taken to increase participation of the local communities in ground water management especially in the areas where resources are depleting, the Ministry replied as under:-

- i. Atal Bhujal Yojana is being implemented in certain water stressed areas of seven States in the country. The essence of Atal Bhujal Yojana can be summed up as "Sustainable Ground Water Management with Community participation". District Implementation Partners (DIPs) or, NGOs have been engaged by the participating States for awareness generation and sensitization of the local communities. Subsequent to this the DIPs are facilitating (i) community participation in planning sustainable management of ground water; ii) development of Gram Panchayat (GP) level water budgets; and iii) preparation

of GP-level Water Security Plans (WSPs).

- ii. A DO letter M-11015/124/2021-CB dated 31 March 2022 has been written by the Secretaries of Department of Health & Family Welfare, Ministry of Panchayati Raj, Department of Drinking Water & Sanitation, Ministry of Women & Child Development, Department of Agriculture and Farmers Welfare, Department of Water Resources, RD & GR, Department of Land Resources & Department of Rural Development to Chief Secretary of all States/UTs bringing out the urgent steps needed to make the villages Water sufficient to meet the SDG goals by engaging the communities through participatory mode.
- iii. Since 2018 to facilitate dissemination of ground water management plans at grassroots level to increase the participation of local communities in groundwater management, CGWB started organizing public interaction programmes (PIP). So far 1,093 public interaction programmes have been conducted by CGWB in which nearly 85,000 persons participated.
- iv. The groundwater regulation guidelines dated 24 Sep 2020 issued by the Ministry with pan-India applicability advocate participatory groundwater management in agriculture sector. The States have been accordingly being advised regularly to follow this aspect while resorting to groundwater management.

112. While highlighting the improvement in Ground Water resources in the Country, the representative of the Ministry, in a power point presentation stated as under:-

“(i) Improvement in GW resources

- a. Annual groundwater recharge in the country has increased by nearly 4.29 BCM
- b. Annual groundwater extraction has decreased by 3.77 BCM.
- c. The overall stage of groundwater extraction level in the country has also decreased from 63.33 % to 61.6 %.
- d. overall improvement observed in groundwater situations in around 576 Assessment units out of 6965 Assessment Units in the country.

(ii) It could be seen that the country appears to move in a positive direction and matter is further being pursued appropriately with all concerned including the States/UTs to achieve the targets of SDGs.”

## **F. OTHER ISSUES**

### **(a) High Yielding Variety Seeds Consuming Less Water**

113. As regards the steps being taken to popularize use of high yielding variety of wheat and paddy seeds that consume less water, the Ministry in a written reply stated as under:-

"Indian Council of Agricultural Research (ICAR), Ministry of Agriculture & Farmers Welfare has identified/developed high yielding short duration varieties of wheat and paddy seeds that consume less water and can provide breeder seed on submission of indent by the State Government. Central government issues advisories to States/UTs from time to time to promote crop rotation, crop diversification and use of less water intensive crops to reduce excessive water use. The groundwater guidelines dated 24 Sep 2020 issued by the Department also advise States/UTs for promoting crop diversification/rotation/other initiatives to reduce over-dependence on groundwater. This Department is implementing the Atal Bhujal Yojana in certain water stressed Gram Panchayats (GPs)/Districts of seven States in the country. The scheme gives special emphasis to participatory groundwater management and preparation of water security plan at GP level and judicious use of groundwater in irrigation is appropriately being addressed to ensure judicious utilization by all concerned."

**(b) National Water System- Desalination And Sustainable Exploitation Of Natural Water Resources**

114. On a query as to whether India is exploring possibilities of developing a National Water system that provides strategic combination of water supply based on desalination and reuse with sustainable exploitation of natural water resources on the lines of countries like Israel, the Ministry informed as under:-

"Department of Science & Technology (DST) has been identified as the nodal agency for Desalination Mission and in accordance with this, DST has launched national calls for proposals to identify and assess the role of desalination for India's water security and evolve time-bound research, development, assessment and demonstration of the program for desalination technologies at various stages of Technology Readiness Levels. Further, DST has supported a field demonstration project to mitigate water problems in the Ausa town of Marathwada region in Maharashtra for the production of potable water by providing a desalination facility integrated with reject water management, which has been successfully handed over to the local Administrative body for further operation and maintenance."

**(c) Reduction In Use Of Chemical Based Fertilizers**

115. Regarding the efforts being made to educate/discourage/disincentivize farmers in order to reduce use of Chemical based fertilizers, the Ministry informed as under:-

"The Indian Council Agricultural Research (ICAR) under Department of Agriculture & Farmers Welfare recommends soil test based balanced and integrated nutrient management through conjunctive use of both inorganic and organic sources (manure, biofertilizers etc.) of plant nutrients to reduce the use of chemical fertilizers. In addition, split application and placement of fertilizers, use of slow releasing N- fertilizers and nitrification inhibitors, growing leguminous crops and use of Resource Conservation Technologies (RCTs) are also advocated. The ICAR also imparts training, organizes front-line demonstrations etc. to educate farmers on all these aspects."



**(d) Rain Water Harvesting**

116. Regarding the steps taken by the Central Government to control water depletion and promote rain water harvesting / conservation, the Ministry stated as under:

- a) Hon'ble Prime Minister has written a letter to all Sarpanchs on 08.06.2019 regarding the importance of water conservation and harvesting and exhorted them to adopt all appropriate measures to make water conservation a mass movement.
- b) Government of India launched Jal Shakti Abhiyan (JSA) in 2019, a time bound campaign with a mission mode approach intended to improve water availability including ground water conditions in the water stressed blocks of 256 districts in India. In this regard, teams of officers from Central Government along-with technical officers from Ministry of Jal Shakti were deputed to visit water stressed districts and to work in close collaboration with district level officials to undertake suitable interventions. In addition, 'Jal Shakti Abhiyan — Catch the Rain' campaign has been launched by Hon'ble Prime Minister of India on 22 March 2021. Further, 'Jal Shakti Abhiyan — Catch the Rain-2022' launched by Hon'ble President of India with focused interventions viz. 1. Water conservation and rainwater harvesting, 2. enumerating, geo- tagging & making inventory of all water bodies; preparation of scientific plans for water conservation based on it, 3. Setting up of Jal Shakti Kendras in all districts, 4. intensive afforestation and 5. awareness generation.
- c) National Water Policy (2012) has been formulated by Department of Water Resources, RD & GR, inter-alia advocates rainwater harvesting and conservation of water and highlights the need for augmenting the availability of water through direct use of rainfall. It also inter-alia, advocates conservation of river, river bodies and infrastructure should be undertaken in a scientifically planned manner through community participation. Further, encroachment and diversion of water bodies and drainage channels must not be allowed and wherever, it has taken place, it should be restored to the extent feasible and maintained properly.
- d) In compliance to the decision taken by the Committee of Secretaries, an 'Inter Ministerial Committee' under the Chairmanship of Secretary (WR, RD & GR) has been constituted to take forward the subject of 'Push on Water Conservation Related Activities for Optimum Utilization of Monsoon Rainfall'.
- e) Ministry has circulated a Model Bill to all the States/UTs to enable them to enact suitable ground water legislation for regulation of its development, which also includes provision of rain water harvesting. So far, 19 States/UTs have adopted and implemented the ground water legislation.
- f) Central Ground Water Authority (CGWA) has been constituted under Section 3 (3) of the "Environment (Protection) Act, 1986" for the purpose of regulation and control of ground water development and management in the Country. CGWA has advised States/UTs to take measures to promote/adopt artificial recharge to ground water / rain water harvesting. CGWA grants No Objection Certificates (NOCs) for ground water abstraction to Industries, Infrastructure units and Mining projects in feasible areas in 20 States/UTs where regulation is not being done by the respective State/UTs. The latest guidelines for control and regulation of groundwater extraction with pan-India applicability was notified by the Ministry on 24 September 2020.
- g) Master Plan for Artificial Recharge to Groundwater- 2020 has been prepared by CGWB in consultation with States/UTs which is a macro level plan indicating various structures for the different terrain conditions of the country including

estimated cost. The Master Plan envisages construction of about 1.42 crore Rain water harvesting and artificial recharge structures in the Country to harness 185 Billion Cubic Meter (BCM) of monsoon rainfall.

- h) CGWB has taken up Aquifer Mapping and Management Programme during XII Plan, under the scheme of Ground Water Management and Regulation. The Aquifer Mapping is aimed to delineate aquifer disposition and their characterization for preparation of aquifer/ area specific ground water management plans with community participation. The management plans are shared with the respective State governments for taking appropriate measures / implementation. Further, Public Interaction Programs (PIP) are being organised at grass root level for disseminating the tenets of the Aquifer Management Plans as part of the National Aquifer Mapping and Management (NAQUIM) Programme for the benefit of the stakeholders.
- i) Best practices of water conservation by various entities including private persons, NGOs, PSUs etc have been compiled and put on the web site of the Ministry for the benefit of general public. An interactive link on best practices has also been created for receiving inputs from public, which, after necessary evaluation/validation are put on the website for the benefit of the public.
- j) Department of Water Resources, RD & GR has instituted National Waterawards to incentivize good practices in water conservation and ground water recharge.
- k) Mass awareness programmes (Trainings, Seminars, Workshops, Exhibitions, Trade Fairs Public Interaction Programmes etc.) are conducted from time to time in various parts of the Country to promote rain water harvesting and artificial recharge to ground water.
- l) The Ministry of Rural Development in consultation and agreement with the Department of Water Resources, RD & GR and the Ministry of Agriculture & Farmers' Welfare has developed an actionable framework for Natural Resources Management (NRM), titled 'Mission Water Conservation" to ensure gainful utilization of funds. The Framework strives to ensure synergies in Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), erstwhile integrated Watershed Management Programme (IWMP) now PMKSY Watershed Development Component (WDC) and Command Area Development & Water Management (CADWM), given their common objectives. Types of common works undertaken under these programmes/ schemes are water conservation and management, water harvesting, soil and moisture conservation, groundwater recharge, flood protection, land development, Command Area Development & Watershed Management.
- m) Central Government supports construction of water harvesting and conservation works primarily through Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC).
- n) A joint advisory of Department of Rural development (DoRD), Department of Water Resources, RD & GR (DoWR, RD & GR), Department of Land Resources (DoLR) and Department of Drinking Water & Sanitation (DoDWS) has been issued on 24.04.2020 to all States/UTs to emphasize efforts in the area of water conservation and water management in the country. The activities include augmentation of existing water sources(s), ground water recharge, rainwater harvesting and grey water management and recharge.
- o) Model Building Bye Laws (MBBL) 2016 circulated by Ministry of Housing & Urban Affairs include provisions for Rainwater Harvesting and it has been shared with all the States / UTs. So far 33 States / UTs have adopted the provisions of rainwater harvesting of MBBL-2016.
- p) The Government has approved Atal Bhujal Yojana (ATAL JAL), a Rs. 6000

crore Central Sector Scheme with World Bank assistance, for sustainable management of ground water resources with community participation. The scheme is being taken up in select areas that include 80 districts, 224 administrative blocks and 8562 water stressed Gram Panchayats of seven states, viz. Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The scheme envisages active participation of the communities, in various activities such as formation/strengthening of Water User Associations, monitoring and disseminating ground water data, water budgeting, preparation of Gram-Panchayat wise water security plans & their implementation through convergence of ongoing schemes and IEC activities related to sustainable ground water management.

**(e) Strengthening Of Central Ground Water Authority**

117. When asked about the formulation of any proposal for strengthening of Central Ground Water Authority, the Ministry stated as under:-

"A proposal for creation of separate Central Ground Water Authority (CGWA) has been formulated. 116 posts have been proposed out of which 6 are already sanctioned. Thus, 110 additional posts are proposed to be created. The proposal is currently under consideration of Government."

## PART II

### OBSERVATIONS/RECOMMENDATIONS OF THE COMMITTEE

#### Introductory

Ground water is the backbone of India's agriculture and drinking water security. Therefore, efficient management of ground water is significant for sustainable use of water.

C&AG Report No. 9 of 2021 (Performance Audit) on the subject 'Ground Water Management and Regulation' pertaining to Ministry of Jal Shakti Department of Water Resources, River Development and Ganga Rejuvenation contained significant results of the Performance Audit of Ground Water Management and Regulation for the period 2013-18. The Report dealt with the mechanism for management of ground water in the country; issues relating to regulation of ground water by Central Ground Water Authority (CGWA) and State Authorities; implementation of schemes on Ground Water Management and Regulation and the extent of achievement of relevant targets under Sustainable Development Goal 6 (ensuring availability and sustainable management of water and sanitation for all). The Report and the issues contained therein have been examined by the Committee and commented upon suitably in the succeeding paragraphs.

#### MANAGEMENT OF GROUND WATER

##### Extraction of Ground Water

1. Audit noticed that during the period 2004 to 2017, the stage of extraction of ground water had increased from 58 to 63 per cent in the country. Four States/UTs (Delhi, Haryana, Punjab and Rajasthan) had a stage of extraction of more than 100 per cent, indicating that extraction of ground water surpassed the recharge levels of ground water. At the district level, in 24 States/UTs, 267 districts had stage of extraction ranging from 64 per cent to 385 per cent. The Committee note that to prevent high extraction of Ground Water, several initiatives in collaboration with States/UTs have been taken up. The Committee also note that many State Governments have implemented their own schemes for

water resources management, including ground water. In the light of India being the largest user of ground water in the world, where Ground Water extraction stands at 245 billion cubic metre (BCM) accounting for around 25 percent of global withdrawals and where Ground Water is pegged at around 64 percent of irrigation needs and 80 percent of drinking water needs of the country, the Committee feel that there is a need for translating the initiatives into concrete results. The fact that four states had exceeded 100% extraction and 267 districts had stage of extraction ranging from 64 per cent to 385 per cent, is a clear indication of the failure to prioritize sustainable water use. The Committee strongly urge the Ministry to persuade the State governments to take immediate and stringent measures to curb excessive extraction of ground water and ensure long-term viability of groundwater resources.

2 Keeping in view, the heterogeneous nature of topography, rainfall and state specific policy on Ground Water across the country, the availability of water may vary from State to State. While there are drought prone regions with very minimal rainfall, there are also regions in the country where there is excess precipitation. The Committee while noting that certain State governments have successfully utilised floodwater for recharging groundwater recommend that such practices may be emulated, wherever feasible, through creation of a series of reservoirs across the floodplains of affected rivers, during monsoon season, for recharging the ground water and for mitigating the flood situation. In order to encourage prudent groundwater extraction practices, the Committee also recommend that the government incentivize and expedite groundwater projects that have demonstrated a tangible impact on ground water extraction levels. The Committee further observe that uncontrolled use of bore well technology leads to exploitation of groundwater at higher rates than the rate of water recharge, which may cause drastic depletion of groundwater. The Committee, therefore, recommend that installation/ use of bore wells be regulated and consider making it mandatory for placing metering systems with all the bore-wells.

#### Periodicity of Assessment of Ground Water

3. The Committee note that as per the approved Expenditure Finance Committee (EFC) memorandum for 2012-17, the assessment of ground water resources in terms of ground water quantity, utilisation pattern, stage of

extraction of ground water, categorisation of units, etc. was to be done every two years by Central Ground Water Board (CGWB). Based on this data, Dynamic Ground Water Assessment Report was to be compiled, to enable further planning and management of ground water by CGWB. Audit however noticed that during the audit period 2013-2018, CGWB conducted such assessments for 2013 and 2017 and published the Reports in June 2017 and July 2019 respectively. CGWB did not carry out this assessment for 2015 resulting in a gap of four years in assessment between 2013 and 2017. The Committee have been informed that a cloud-based system for assessment “INDIA-Groundwater Resource Estimation System (IN-GRES)” has been put in place. Besides, a Resolution dated 08 Feb 2022 has been notified in the Gazette of India for constitution of a Central Level Expert Group (CLEG) for overall supervision of the assessment process. The Committee have further been informed that post 2022 assessment of groundwater resources has to be done on an annual basis. The Committee recommend the Ministry to ensure that the assessment process is conducted invariably, on annual basis, with prompt publication of the assessment reports for effective planning and management of Groundwater. The Committee also desire that the parameters used in these assessments be periodically reviewed to improve the accuracy and reliability of the data.

#### Ground Water Monitoring

4. The Committee are constrained to note that as against the target of monitoring of 50000 wells by March 2017, CGWB as on March 2021, had a monitored network of only 22,835 wells. Even for undertaking Real Time Ground Water monitoring, CGWB has not made much headway even after lapse of 5 years, as various projects of CGWB are still in the planning stage. The Committee while noting that the Ministry is yet to achieve the targets of monitoring wells planned for 2012-17, feel that despite the approved schemes and substantial funds allocated for these purposes, the actual implementation has been sluggish, leading to a significant shortfall in the number of wells monitored. The Committee while observing that monitoring is a key tool to secure that contaminated water is not used for consumption or irrigation and to keep track and control if water resources are exploited sustainably, desire the Ministry to identify the reasons for the delays and take time-bound action to expedite the implementation of the schemes and apprise the Committee thereof.

## Assessment of water levels and factors affecting Ground Water Quantity

5. The Committee are deeply concerned about the declining water levels in the majority of monitored wells, both at the national and state levels. The Committee further note that in 14 States factors affecting ground water quantity were reported to be available which *inter-alia* include power subsidies for agriculture, water-intensive crop cultivation, rainfall deficit, urbanization, and excessive water use in irrigation and industries. The Committee note that factors affecting quantity of ground water could not be identified for the States/UTs in which assessment was not conducted. It is astonishing that these states are managing their water requirements without a comprehensive understanding of the factors influencing ground water availability. In the absence of pan-India data on factors affecting ground water quantity, the Committee are of the opinion that it will be difficult to devise effective strategies to address the issue of declining water levels. The Committee therefore feel that there is a need to ensure that factors affecting ground water quantity be ascertained and made available for framing national level policy. The Committee desire that regular and thorough assessments of the factors affecting ground water quantity in all the states be conducted to ensure efficient utilization of this precious resource.

## Assessment of Ground Water Quality

6. The Committee note that the factors affecting ground water quality were available in respect of 11 States/UTs only. Most of the States/UTs that conducted assessment of change in quality of ground water reported excessive use of fertilizers and pesticides, disposal of industrial and municipal waste and sea water intrusion as factors for deterioration of ground water quality. The Committee note with concern that a significant number of locations, especially in West Bengal and Punjab, have been identified with high levels of arsenic, fluoride, and salinity, surpassing permissible limits. Further, the Committee note that monitoring of ground water quality was done every year and the data shared through the India Water Resource Information System (WRIS) portal by department of River Development and Ganga Rejuvenation (RD&GR) with States. However the Water Resource Information System (WRIS) portal contained data as of 2015-16 only. In the considered view of the Committee, non-availability of reliable and authentic data not only results in lack of comprehensive understanding of the threats posed by ground water contamination but also

prevents evolving effective measures to deal with them. In view of the foregoing, the Committee recommend that (i) findings of the Central Ground Water Board (CGWB) and the States be integrated to obtain reliable indicators of the ground water quality nationwide; and (ii) Water Resource Information System (WRIS) data may be updated on real time basis to facilitate informed decision-making and the implementation of appropriate ground water management strategies.

7. Audit observed that as per the data for 2015 based on 15,165 locations in 32 States tested by CGWB, ground water had levels of contaminants higher than permissible limits of Arsenic (697 locations), Fluoride (637 locations), Nitrate (2,015 locations), Iron (1,389 locations) and Salinity (587 locations). The number of cases of fluorosis was significant in Andhra Pradesh, West Bengal and Madhya Pradesh. In the absence of any such assessment by the remaining States/UTs, the threats due to contamination of ground water could not be ascertained in these States/UTs. Regarding the action taken to assess the factors affecting ground water quality in the States/UTs where no such assessment has been done, the Ministry stated that Central Ground Water Board generates ground water quality data on a regional scale during various scientific studies and ground water quality monitoring throughout the country. These studies indicate the occurrence of contaminants such as Flouride, Arsenic, Nitrate, Iron and Heavy Metals beyond permissible limits (as per BIS) for human consumption in isolated pockets in various States / UTs. The Committee note that the Department of Drinking Water and Sanitation (DoDW&S) had launched a National Water Quality Sub-Mission (NWQSM) on 22<sup>nd</sup> March, 2017 as a part of National Rural Drinking Water Programme (NRDWP), which has now been subsumed under Jal Jeevan Mission, to provide safe drinking water to 27,544 arsenic/fluoride affected rural habitations in the country. It has also been informed that Government of India launched Atal Mission for Rejuvenation and Urban Transformation (AMRUT 2.0) on 01 October, 2021 for the period of 05 years (FY 2021-22 to 2025-26) which focuses on making cities' water secure through recycle/reuse of treated sewage, rejuvenation of water bodies and water conservation. The Committee note from the Ministry's reply that under NAQUIM, CGWB constructs arsenic safe exploratory wells in arsenic affected parts of some States including West Bengal and the arsenic safe deeper aquifer zones have been identified and wells have been constructed tapping the arsenic safe deeper aquifers using innovative cement sealing technique. As per the information made available to the Committee, 513 exploratory wells tapping



arsenic safe aquifers have been constructed under NAQUIM programme including 40 in Bihar, 188 in West Bengal and 285 in Uttar Pradesh. Further, the innovative cement sealing technique of CGWB has been shared with the State agencies to utilize the technique to construct arsenic free wells. In light of the above, the Committee recommend that (i) all out effort to enhance the number of wells tapping arsenic safe aquifers, may be made. As regards the cement sealing technology, the Committee desire that a study may be conducted to ascertain the efficacy of the efforts made to ensure quality water availability to the inhabitants of the affected States (ii) The Ministry may take steps towards the assessment of water quality by all the States/UTs to ensure that the threats due to contamination of ground water are ascertained in all States/UTs across the country and (iii) Committee may be apprised of the resultant impact on provision of safe drinking water to the population covered under AMRUT 2.0 and Jal Jeevan Mission.

#### Model Bill on Ground Water and Legislative framework in States/UTs

8. The Committee note that to enable the States to enact Ground Water Legislation, DoWR, RD&GR circulated in 2005, a Model Bill to all the States/UTs for regulation and development of ground water. However, the Model Bill was under review till December 2019. As of December 2019, 19 States/UTs had enacted legislation for management of ground water. In this regard, Ministry of Jal Shakti apprised the Committee that the revised Model bill on Ground Water has been finalized by the Department which is being clubbed with other Model Bills (of the Department) to have a holistic comprehensive Model Bill on water management (encompassing all matters of water falling in the domain of States/UTs) in the country. Further, Ministry of Jal Shakti has issued new guidelines on 24.09.2020 for regulation and control of ground water extraction by industrial, infrastructure and mining projects. These guidelines have pan-India applicability. The Ministry also added that 13 States/ UTs (10 States and 3 UTs) have taken Initiatives for enactment of legislation on the basis of the Model Bill. The Committee are optimistic that new guidelines issued on 24.09.2020 for regulation and control of ground water extraction by industrial, infrastructure and mining projects with pan-India applicability, have played a key role in addressing other related issues of the States/UTs thereby paving the way for enactment of legislation based on the Model Bill by the remaining States/ UTs. The Committee also desire that the Ministry may expedite the efforts to convince remaining States to take suitable steps in this direction.

## Human Resource constraints faced by Central agencies managing Ground Water

9. The Committee note that there was shortage of human resources in scientific and engineering categories in Central Ground Water Board (CGWB) and its regional and divisional offices. To take care of the deficiency in staff, the Ministry informed that various steps have been/are being taken by CGWB and the Department which *inter-alia* include initiation of the proposal for filling up 840 posts through Direct Recruitment / Deputation / Promotion in consultation with UPSC / SSC and engagement of young professionals and consultants on a contractual basis. Noting that as a part of Human Resource Development measures, the Ministry have also resorted to hiring of consultants/professionals in addition to other initiatives, the Committee would like to point out that ad-hoc arrangement of engaging young professionals and consultants on a contractual basis may be a short term measure to cater to the immediate requirement of CGWB. For efficient working of the organization, the Central agencies and its departments should look for long term solution by engaging permanent staff/experts. In light of the above the Committee desire that action to fill up direct recruitment / promotional vacancies be expedited and proposal for filling up 840 posts in scientific and engineering categories in CGWB be finalized with due promptitude. The Committee desire to be apprised of the outcome of the action initiated by Ministry in this regard.

## GROUND WATER REGULATION

### Projects granted Consent to Operate by State Pollution Control Boards (SPCBs)/ Pollution Control Committees (PCCs) and Projects granted license by Bureau of Indian Standards.

10. Audit scrutiny revealed that out of a sample of 328 cases in 18 States, where the Consent to Operate (CTO) granted to a project proponent included a condition which required NOC for Ground Water extraction, 253 projects (77 per cent) were operating without NOCs. Audit had also pointed out that in 15 States for which data was made available to Audit, 3,189 Bureau of Indian Standards (BIS) licenses were issued to packaged drinking water units since 2013, of which in 2,475 cases (78 per cent), the project proponents were operating without obtaining NOCs from CGWA. The Committee are of the view that projects, which operate without NOCs reflect on the poor control exercised by CGWA. The

Committee emphasize that there is an urgent need to further enhance the inspection and compliance mechanism of CGWB. They recommend the Ministry to establish a robust monitoring mechanism which may also be utilized by the general public/NGOs/other stakeholders to report/ send photos/videos of illegal extraction of ground water and violation of other NOC conditions by project proponents.

Delay in processing of applications by CGWA for grant/renewal of NOC in non-notified areas

11. Audit pointed out that during 2013-19, Central Ground Water Authority (CGWA) accorded 3,517 fresh NOCs and renewed 320 NOCs for Ground Water withdrawal to various industry, mining and infrastructure projects. As on 31 March 2019, 10,758 applications for grant of NOC and 144 applications for renewal were pending. Citing reasons for pendency in processing applications, the Ministry explained that the pendency as on 31.03.2019 was owing to certain concerns/observations raised by National Green Tribunal in respect of over-exploited, critical and semi-critical areas and after notification of new guidelines w.e.f. 24.09.2020, all pendency had been cleared. The Ministry informed that to expeditiously process the applications, CGWA has *inter-alia* fixed timelines for processing of NOC application at each stage, the NOC portal (NOCAP portal) has been revamped for submission of NOC applications by the project proponents and issue of all NOCs by the CGWA through online mode, the powers of issue of NOCs have been decentralized among field functionaries and a booklet on Standard Operating Procedure (SoP) has been issued by the CGWA to standardize the process of NOC issuance and to cut the discretionary powers of officers. While acknowledging the initiatives taken for expeditiously processing / issuing NOCs within 45 days through NOC portal, the Committee are of the opinion that merely revamping the NOC portal and decentralizing powers among field functionaries may not be enough to address the systemic inefficiencies and discretionary practices. The Committee desire thorough and recorded field inspections to ensure transparent implementation of the guidelines issued w.e.f. 24.09.2020 and the SoP meant for field functionaries. The Committee desire to be apprised of the impact of the measures taken on the average time taken by the CGWA for issuing NOCs.

### Non-receipt of applications for renewal on expiry of NOC

12. The Committee note from Audit findings that in 474 cases, renewal of NOC was due during 2013-18 but the project proponents did not apply for renewal. CGWA did not take any action under section 15 of the Environment (Protection) Act, 1986 against these project proponents. Thus, even after expiry of the NOC, existing industries/projects continued to draw Ground Water without any regulation. While enumerating the reasons, the Ministry stated that prior to April, 2015, there was no online system for NOC application processing and all the NOCs were being issued off-line. Record of such NOCs, therefore, was not available and it was difficult to manually keep track of all the NOCs getting expired though all efforts were made by the CGWA in this direction. Further, the inspection power of visiting industries/project proponents were vested with handful staffs/officers of CGWA which has now been widened by allowing this power to be delegated to other CGWB officers, DMs/DCs etc which has resulted in better implementation of regulation measures. The Ministry stated that CGWA has issued 3200 notices to various project proponents for not complying with ground water regulatory conditions and penalty/environmental compensation to the tune of Rs 15.77 crore has already been imposed against 1,341 proponents who were found extracting groundwater illegally/violated NOC conditions since issue of new guidelines dated 24 Sep. 2020. The Ministry's submission that it was difficult to manually keep track of all the NOCs getting expired prior to 2015 is unacceptable. The Committee desire to be apprised of the action taken against the remaining project proponents for not complying with ground water regulatory conditions. The Committee expect the online system for NOC application processing to facilitate tracking of NOCs' expiry and proactive action for timely renewal and would like to be apprised of the resultant impact in application and renewal of NOCs. The Committee also insist on the timely finalization and implementation of the proposal to strengthen the CGWA.

### Post NOC monitoring by CGWA and Authorised officers

13. The Committee express deep concern over the lack of enforcement of conditions stipulated in NOCs by Central Ground Water Authority (CGWA). The Committee note that joint field visits exposed widespread non-compliance with NOC conditions, however despite widespread violations, CGWA issued show cause notices to a paltry number of 99 project proponents during 2013-2018. The Ministry have informed that apart from issuing of notices and levying of penalty since the new guidelines came into effect, a Mobile App has also been developed to enable project proponents to submit self-compliance with the facility for field verification by CGWB officers. The Ministry must demonstrate unwavering commitment to ensuring compliance with NOC conditions. The Committee insist on rigorous adherence to guidelines and desire that a detailed report on the extent of penalties, offences registered, and inquiries initiated in last five years be furnished to them .

### **IMPLEMENTATION OF SCHEMES ON GROUND WATER MANAGEMENT AND REGULATION (GWMR)**

#### Financial performance of GWMRS

14. The Committee note that the approved outlay for the Scheme 'Ground Water Management and Regulation (GWMR)' was Rs. 4,050.66 crore during 2012-19 against which budget allocations were Rs. 2,349.48 crore. Against the budget allocation of Rs. 2,349.48 crore, the actual expenditure under the Scheme was Rs. 1,109.73 crore during 2012-19. As regards the measures taken up to ensure full utilisation of funds released to it, the Ministry during the course of examination informed that CGWB is closely monitoring the tendering and procurement activities and has also engaged a Project Management Consultant (PMC) for tendering & execution activities which has resulted in improved utilization of funds. The Ministry further stated that these measures have resulted in improved average annual expenditure from Rs. 116 crore during 2012-17, to Rs. 220 crore during 2017-21. In view of the activities envisaged under the scheme having a direct impact on livelihoods and survival of millions of citizens of the country, the Committee recommend that the Ministry may ensure optimum fund utilization, within prescribed timelines. The Committee desire to be apprised of the specific steps taken in this regard.

## Targets of aquifer mapping and achievements and incomplete aquifer mapping reports

15. The Committee note from Audit revelation that an area of 24.8 lakh sq. km was identified for Aquifer Mapping in the country, Central Ground Water Board (CGWB) covered an area of 13 lakh sq. km. (52 per cent) as of September 2020. Further, Aquifer Mapping Reports for only 6.5 lakh sq. km. were finalized. It has been informed that as on 31st March 2022, 21 lakh sq km had already been covered and the targets set for coverage had been achieved. It has also been informed and that the entire area identified for NAQUIM studies is targeted to be covered by 31st March 2023. As regards reports of NAQUIM studies, against an area of 16.33 lakh sq km covered till 31st March 2021, reports in respect of 14 lakh sq km had been issued as on date. The Ministry have cited lack of adequate manpower and deployment of concerned officers in additional activities like sharing of outputs with District Authorities, Public Interaction Programmes etc. as the reason for the delay in compilation of the reports. It has also been reported that during the year 2021-22 an additional area of 4.8 lakh sq km had been covered, reports for which were to be issued during the year 2022. The Ministry assured that earnest attempts were being made to issue reports in respect of the entire area covered as on 31<sup>st</sup> March 2022, by September, 2022. The Committee note that the Ministry have taken steps like temporary deployment of officers alongwith hiring of young professionals to assist in NAQUIM studies. The Committee would like to be apprised whether targets of aquifer mapping have been achieved by 31st March 2023 and whether the reports for the same have also been issued. The Committee desire that the findings of NAQUIM studies so conducted and the action envisaged thereon be shared with them within three months of presentation of this report to the Parliament.

## Non preparation of Ground Water Models

16. The Committee note that Ground water models provide a tool to estimate ground water availability for various water use strategies and to determine the cumulative effects of increased water use and drought conditions. A ground water model is a numerical representation of the aquifer system capable of simulating historical and predicting future aquifer conditions. The purpose of the NAQUIM programme was to provide an Aquifer Response Model that can be

used to develop reliable and timely information on ground water availability for the region to ensure adequate supplies or recognise inadequate supplies over a 15 year planning period. The Committee note that although CGWB has conducted aquifer mapping in a significant area, the completion of ground water modeling is limited to only 4.5 lakh sq. km. The Ministry's progress in groundwater modeling is visibly slow, and the Committee desire that urgent action may be taken to prioritize and expedite this crucial project within a specific timeframe.

### Dissemination of NAQUIM outputs

#### Designing of web-based system

17. Audit pointed out that though CGWB had published aquifer mapping reports, a web-based system for easy dissemination of the information on the aquifer mapping was not designed, as envisaged. In this regard the Ministry have informed that NAQUIM reports are being disseminated through CGWB website. Further, a separate web-portal Aquifer Information and Management System (AIMS) has been developed for easy dissemination of information on aquifer mapping. The AIMS portal is being further upgraded by CGWB to have easier dissemination of aquifer related information to the public at block levels. In addition to this, groundwater levels, water quality information can also be accessed through India-WRIS (Water Resource Information System) portal maintained by National Water Informatics Centre. While noting the steps taken regarding setting up of a web-based system for easy dissemination of information on aquifer mapping, the Committee desire that the Ministry ensure that information available on the portal is regularly updated and establish a feedback mechanism on the system so designed to ensure that the system meets the envisaged criteria and useful information is disseminated to various stakeholders to enable upgrading the system on a continuous basis.

### Action by State Governments on Aquifer mapping reports

18. Audit had observed that of the 201 reports included in the programme, Aquifer mapping reports of only 168 districts were shared with the District Administration concerned till November 2019. The Committee further note from the reply of the Ministry that NAQUIM studies are complete in parts of 538 districts and outputs in respect of 385 districts had been shared and earnest

efforts were being made to share the NAQUIM outputs in respect of all the covered districts with the district authorities during the year 2022-23. The Committee has also been informed that the NAQUIM outputs shared with the State Governments include information about aquifers in the States, ground water level, ground water quality, ground water resource availability etc along with a management plan. States of Andhra Pradesh, Delhi, Haryana, Kerala, Madhya Pradesh, Rajasthan, Tamil Nadu, Tripura and Uttar Pradesh are using the information for ground water management planning and implementation. NAQUIM outputs are also being used in the seven States (Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh) where Atal Bhujal Yojana is being implemented. The Committee notes from the audit findings that many State Governments have not acted on the aquifer mapping reports due to various constraints such as map scale being too small to locate the areas, non-receipt of funds from CGWB or Central Government to implement the reports in the field, etc. Given the fact that the information contained in the report has potential for use by many agencies engaged in managing water resources, agriculture, irrigation etc., the Committee recommends that along with sharing of information with the District Authorities a web-based interface may be utilised to ensure timely resolution of issues such as scale being too small and to enhance coordination between various agencies at central and state levels for implementation of the recommendations made in the National Aquifer Mapping project reports. The Committee further desires the Ministry to expedite the transfer of funds to the state governments to enable them to implement the recommendations contained in NAQUIM reports.

### Participatory Ground Water Management

19. Audit had pointed out that although an outlay of Rs. 575.38 crore was provided for the period 2013-17 under the component Participatory Ground Water Management (PGWM) in accordance with the National Water Policy 2012, no expenditure was incurred. The component was dropped from the subsequent EFC memo of 2017-20 and is now being taken up as a separate scheme on participatory ground water management through the Atal Bhujal Yojana (ABHY), a Rs. 6,000 crore scheme with World Bank funding which was launched in 2019. The scheme lays emphasis on community participation and demand side



interventions for sustainable ground water management in identified water stressed areas in seven States of the country. The Committee note that ABHY is being implemented in 7 states only and is being taken up in 8,562 water stressed Gram Panchayats of 224 administrative blocks/ Talukas in 80 districts of seven States, viz. Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. It is being implemented from 01.04.2020 for a period of 5 years with mid-term review scheduled in 2022. Based upon the evaluation/feedback, decision on extension of the Scheme to other areas was to be taken. Since the mid-term review of ABHY was scheduled in 2022, the Committee would like to be apprised of the results of the same with the details of expenditure incurred .The Committee while noting that the participatory ground water management is envisaged to make a significant step in ground water management at grass root level to enable the community and stake holders to monitor and manage the ground water as common pool resources themselves desire that based on the positive results of the Scheme, the scope of the Scheme be augmented to other areas for gradually covering the entire country. The Committee also recommend that best practices of participatory Ground Water management being followed in states may be documented at the Central level and the same may be replicated in the other States as well. The Committee further desire that special awareness campaigns may be organised especially in rural areas for including students of the schools as brand ambassadors of water conservation initiatives. Suitable steps may be initiated in consultation with the Ministry of Education to include workshops on 'Water Conservation' in the school syllabi to spread awareness for water conservation amongst the future citizens of the country. The Ministry may also take steps to organise 'Jal Pakhwada' for 15 days in a year, in schools, educational institutions, and government institutions across the country for spreading awareness about Ground Water conservation and recharge. During the 'Jal Pakhwada' events like quiz competitions, debates, essay writing competitions, showcasing of best practices on groundwater recharge and conservation etc. may be held to encourage participatory Ground water management..

### Capacity Building

20. Audit observed that no action was taken on four out of 12 recommendations made by an Expert Group constituted for benchmarking of various activities of CGWB with international best practices, on capacity building

in CGWB. These four recommendations included attending of international conferences and presentation of important findings by selected CGWB officers/staff; development of a mentorship programme between CGWB and international experts to provide one on-one training for specialized hydro-geologic techniques and application; attendance at scientific conferences; and providing of references by CGWB on its website for self-training in the field of hydrogeology. Thus, in spite of these recommendations being of considerable importance for CGWB with respect to its future infrastructure and human resource requirements, CGWB failed to take action on these recommendations. The Department accepted that recommendations were not implemented completely. The Committee are of the considered opinion that state of the art infrastructure and world class technological knowhow in the field of Ground water management are crucial for preserving one of the most crucial natural resources available for the citizens of the country. The Committee therefore recommend that Central Ground Water Board may take expeditious action to ensure that recommendations of the report of the Expert Group for augmenting its infrastructure, technological upgradation and for capacity building are implemented without further delay. The Committee are of the opinion that out of these four recommendations the Ministry should initially strive to develop the mentorship programme between CGWB and international experts as well as providing references for self training in the field of hydrogeology. The Committee also recommend that the department may initiate suitable steps to bring best practices being followed across the world in the field of ground water management to the country. The Ministry may also consider technology exchange with friendly countries which are following the latest technologies in the field of Ground Water Management.

#### Schemes/Initiatives of States/UTs for management of Ground Water

21. The Committee note that to tackle the problems affecting quality and quantity of ground water, States/UTs implemented various schemes for water supply, irrigation, ground water recharge, effluent treatment, etc. It has been highlighted by audit that while some of the schemes implemented in the States were effective in improving the condition of ground water levels in the States, there were schemes in which the envisaged targets were not achieved and

therefore, needed better control and implementation to ensure the desired results. Audit observed deficiencies in schemes of some states. These included lack of analysis of ground water level data before recommending proposals for construction of tube wells (Bihar); delay in finalisation of project on Ground Water Recharge action plan (Delhi); shortfall in the activities of State Ground Water Conservation Mission, lag in achievement of targets for implementing the use of sprinkle irrigation (Uttar Pradesh), etc. The Committee are of the considered opinion that apart from necessary handholding of States, the Ministry may augment efforts towards turning Ground Water Management into a National Mission for all stakeholders and impress upon the State Governments to review the performance of their schemes related to ground water and take measures to ensure that the envisaged results are achieved by adopting an integrated approach for recharge/augmentation of ground water.

## **SUSTAINABLE DEVELOPMENT GOALS AND GROUND WATER**

22. Sustainable development is a crucial goal that requires collective efforts to ensure a prosperous and resilient future for people and the planet. The United Nations adopted the 2030 Agenda for Sustainable Development, consisting of 17 goals and 169 targets. Goal 6 specifically focuses on ensuring the availability and sustainable management of water and sanitation for all. While the responsibility for managing water resources lies with the state governments, the Central Government has taken steps to achieve SDG 6 through initiatives like the Jal Jeevan Mission and Atal Bhujal Yojana. While taking note of the steps taken by the Government towards achieving SDG No. 6, the Committee urge the Government to expedite the efforts to ensure that clean water and sanitation for the citizens of the country is available within a time bound manner.

### **Targets relating to Ground Water**

#### **Target 6.4 — Annual ground water withdrawal against net annual availability**

23. The Committee note that the NITI Aayog is responsible for coordinating the SDGs in India. For Goal 6, the targets identified include increasing water-use efficiency, protecting water-related ecosystems, and supporting local community participation in water management. Regarding annual ground water withdrawal against net annual availability (Target 6.4), the audit revealed that the annual groundwater withdrawal had increased, with several districts exceeding the

target of 70% withdrawal against net annual availability. While the Ministry reported some improvement in the overall stage of Ground Water extraction level in the country, the Committee emphasize the need for concerted efforts to achieve the SDG targets and reduce groundwater extraction to the desired extent.

**Target 6.6 - By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes**

24. Regarding Target 6.6, the Committee have been informed that CGWB is preparing the aquifer mapping and management plan (for groundwater) for the entire country which is likely to be completed by 31 Mar 2023. It has also been communicated that for facilitating States to take appropriate measures for sustainable groundwater management, the management plans including those in the agriculture sector (like plans for crop diversification, sprinkler system, drip irrigation etc.) are being shared with the respective State Governments. In this regard, the Committee note that the target 6.6 was to be achieved by 2020. Hence there is already a delay in meeting a global commitment within timelines with regard to Target 6.6. The Committee, therefore, urge the Ministry to ensure that coordinated efforts, both at the Centre and State level are taken to finish aquifer mapping and management plan in a time bound manner. Further, the Committee desire that sustainable ground water management plans like crop diversification, sprinkler system and drip irrigation may be given large scale publicity especially in rural areas to promote judicious use of water and to arrest indiscriminate wastage of ground water in the country.

**Target 6 b - Local communities' participation in water management**

25. Regarding Target 6-b, the Committee note that the National Water Policy (2012) envisages that declining ground water levels in over-exploited areas need to be arrested by introducing improved technologies of water use, incentivising efficient water use and encouraging community based management of aquifers. The Committee highlight the lack of action taken on promoting local community participation in groundwater management, which was initially proposed under the Ground Water Management and Regulation Scheme. Although the Atal Bhujal Yojana has been launched in seven states, the Committee urge the Ministry to expand its scope to cover the entire country and provide updates on the outcomes achieved through the scheme. As the participatory management was envisaged to enable the community and stake holders to monitor and manage the ground water as common pool resources themselves, a coordinated effort

involving Government departments, research institutes, Panchayati Raj Institutions, civil society organisations and stakeholders at village level is a pre-requisite. The Committee urge the Ministry to involve local communities in coordination with Members of Legislative Assemblies, Panchayati Raj Institutions and State government functionaries at the village level in cleaning, desilting and restoring water bodies which can act as natural recharge points. The local administration may be instructed to monitor water levels in reservoirs/ponds/wells/baolis etc. through use of technologies like Geo Tagging and Remote Sensing.

## OTHER ISSUES

### High Yielding Variety Seeds Consuming Less Water

26. The Committee note that Indian Council of Agricultural Research (ICAR), Ministry of Agriculture & Farmers Welfare has identified/developed high yielding short duration varieties of wheat and paddy seeds that consume less water and can provide breeder seeds on submission of indent by the State Government. The Committee also note that Central government issues advisories to States/UTs from time to time to promote crop rotation, crop diversification and use of less water intensive crops to reduce excessive water use. The groundwater guidelines dated 24 Sep 2020 issued by the Department also advise States/UTs for promoting crop diversification/rotation/other initiatives to reduce over-dependence on groundwater. The Committee have also been informed by the Ministry that the Department is implementing the Atal Bhujal Yojana in certain water stressed Gram Panchayats (GPs)/Districts of seven States in the country to ensure judicious utilization of by all concerned. The Committee in this regard are of the considered opinion that keeping in view the fact that major component of Ground Water in the country is utilised for irrigation related activities in the agriculture sector, it is imperative that the farmers of the country are encouraged to take up crops that are not water intensive. The Committee also note that the Government has decided to celebrate 2023 as the year of Millets. In this regard, the Committee recommend that the Ministry support this mission by aligning it with policy measures, including budgetary support and financial incentives for the farmers of the country.

## National Water system- Desalination and sustainable exploitation of natural water resources

27. The Committee note that Department of Science & Technology (DST) has been identified as the nodal agency for Desalination Mission. Further DST has launched national calls for proposals to identify and assess the role of desalination for India's water security and evolve time-bound research, development, assessment and demonstration of the program for desalination technologies at various stages of Technology Readiness Levels. The Committee also note that a field demonstration project to mitigate water problems in the Ausa town of Marathwada region in Maharashtra had been supported by DST for the production of potable water by providing a desalination facility integrated with reject water management. While noting that the desalination facility in Ausa Town of Maharashtra has been successfully handed over to the local Administrative body for further operation and maintenance, the Committee desire that the Government must seriously consider replicating the same in areas having similar water situations across the country after assessing the outcome of project in Ausa Town. The Committee strongly recommend that technological interventions in the field of desalination for India's water security must be given top priority.

### Rain Water Harvesting

28. Regarding initiatives on Rain Water Harvesting, the Committee have been informed about Jal Shakti-Abhiyan-Catch the Rain, Atal Bhujal Yojana, Guidelines issued to all states on 24th September 2020 etc. The Committee also note that Ministry of Housing & Urban Affairs (MoHUA) has formulated guidelines for the States to adopt measures suitable to local conditions, such as Unified Building Bye Laws (UBBL) of Delhi, 2016, Model Building Bye Laws (MBBL), 2016 and Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines, 2014, wherein adequate focus has been given on requirement of rainwater harvesting and water conservation measures. As per MBBL, all buildings having a plot size of 100 sq.m. or, more shall mandatorily include the complete proposal of rainwater harvesting. 33 States/ UTs have adopted the features of these Bye Laws. While noting the efforts made

towards ground water recharge and rainwater harvesting, the Committee strongly feel that the Government needs to do much more in this direction. The Committee desire that concerted efforts with renewed vigour may be taken to explore the feasibility of building rainwater harvesting structures and for taking up water conservation measures on the existing Government buildings both at the Centre and at the State level. The Committee also recommend that steps be initiated to persuade all state governments to ensure construction of rainwater harvesting structures in buildings that are to be constructed in future across the country, in harmony with Model Building Bye Laws and relevant guidelines, to facilitate rainwater harvesting for secure future of the country with regard to Ground Water. A status report may be furnished to the Committee.

### Conclusion

29. Ground Water being a lifeline of the populace of the country and also the engine of growth for the nation's economy, its efficient management is of paramount importance and Ground Water Management and Regulation (GWMR)"scheme launched by the government during the XII<sup>th</sup> Five Year Plan (2012-17) was a welcome step towards this end. During the implementation of the Scheme, it has been observed that to achieve the envisaged objectives of Ground Water Management, plethora of related schemes have been floated both at the Centre and the States such as 'Atal Bhujal Yojana', "Jal Shakti Abhiyan: Catch the Rain", Pradhan Mantri Krishi Sinchayee Yojana, 'Mukhyamantri Jal Swavlamban Abhiyan' in Rajasthan, 'Jalyukt Shibar' in Maharashtra, 'Sujalam Sufalam Abhiyan' in Gujarat, 'Mission Kakatiya' in Telangana, Neeru Chettu' in Andhra Pradesh, Jal Jeevan Hariyali in Bihar, 'Jal Hi Jeevan' in Haryana, 'Pani Bachao, Paisa Kamao' in Punjab and Kudimaramath scheme in Tamil Nadu etc. As perused from the records, most of these Schemes have been brought in with designated objectives. The Committee while noting the well intentioned Schemes of Central as well as State Governments, are of the opinion that there is a need to synchronise these schemes to the larger objective of achieving sustainable Ground Water management. The Committee therefore recommend the Ministry to devise a robust coordinating mechanism at the Central level and impress upon the States to follow suit.

NEW DELHI;  
September, 2023  
Bhadrapada, 1945 (*Saka*)

ADHIR RANJAN CHOWDHURY  
Chairperson,  
Public Accounts Committee