22

STANDING COMMITTEE ON WATER RESOURCES

(2022-23)

SEVENTEENTH LOK SABHA

MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES, RIVER DEVELOPMENT & GANGA REJUVENATION

GROUNDWATER: A VALUABLE BUT DIMINISHING RESOURCE

TWENTY SECOND REPORT

LOK SABHA SECRETARIAT

NEW DELHI

March, 2023 / Phalguna,1944 (Saka)

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Presented to Lok Sabha on 20.03.2023

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LOK SABHA SECRETARIAT
NEW DELHI

March, 2023 / Phalguna,1944 (Saka)

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COMPOSITON OF THE STANDING COMMITTEE ON WATER RESOURCES (2022-23)

Shri Parbatbhai Savabhai Patel - Chairperson

LOK SABHA

2. Shri Vijay Baghel
3. Shri Nihal Chand Chauhan
4. Shri Bhagirath Choudhary
5. Shri Chandra Prakash Choudhary
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23. Shri Aneel Prasad Hegde
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25. Smt. Mausam Noor
26. Shri Sharad Pawar
27. Shri V. Vijayendra Prasad
28. Shri Arun Singh
29. Sant Balbir Singh
30. Shri Pramod Tiwari
31. Vacant

SECRETARIAT

1.	Shri Chander Mohan	-	Joint Secretary
2.	Shri Ajay Kumar Sood	-	Director
2.	Shri Ram Lal Yadav	-	Additional Director
3.	Smt. Shanta B. Datta	-	Under Secretary

INTRODUCTION

I, the Chairperson, Standing Committee on Water Resources (2022-23) having been authorized by the Committee to submit the Report on their behalf, present the Twenty Second Report on “Groundwater: A Valuable but Diminishing Resource ".

2. The Standing Committee on Water Resources (2019 -20) had taken up the subject “Groundwater: A Valuable but Diminishing Resource” for examination. As the Report could not be finalized during the tenure of the Committee, therefore, this subject was again selected by the Committee in their successive tenures i.e. 2020-21, 2021-22 and 2022-23 for detailed examination and Report. The Committee took evidence of the representatives of the Ministry of Jal Shakti – Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Agriculture & Farmers' Welfare –Department of Agriculture &Farmers Welfare, Ministry of Rural Development - Department of Land Resources and Department of Rural Development, Ministry of Power, Ministry of Environment, Forest and Climate Change and Ministry of Housing and Urban Affairs on 21 January 2020, 28 December 2020 and 18 January 2021.

3. The Report was considered and adopted by the Committee at their sitting held on 14.03.2023.

4. The Committee wish to express their thanks to the representatives of the Ministry of Jal Shakti – Department of Water Resources, River Development & Ganga Rejuvenation, Ministry of Agriculture & Farmers' Welfare – Department of Agriculture &Farmers Welfare, Ministry of Rural Development - Department of Land Resources and Department of Rural Development, Ministry of Power, Ministry of Environment, Forest and Climate Change and Ministry of Housing and Urban Affairs for providing the requisite written information as also for depositions made in connection with the detailed examination of the subject.

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

NEW DELHI
14 March, 2023
23 Phalguna,1944 (Saka)

Shri Parbatbhai Savabhai Patel
Chairperson,
Standing Committee on Water Resources

ABBREVIATIONS

Atal Jal	:	Atal Bhujal Yojana
AIBP	:	Accelerated Irrigation Benefit Programme
AIIB	:	Asian Infrastructure Investment Bank
AMRUT	:	Atal Mission for Rejuvenation and Urban Transformation
Appx.	:	Approximately
BBMB	:	Bhakra Beas Management Board
BCM	:	Billion Cubic Meter
BE	:	Budget Estimate
BOD	:	Biochemical Oxygen Demand
CA	:	Central Assistance
CAD	:	Command Area Development
CAMPA	:	Compensatory Afforestation Fund Management and Planning Authority
CADWM	:	Command Area Development and Water Management Programme
CCA	:	Cultivable Command Area
CCEA	:	Cabinet Committee on Economic Affairs
CEDAR	:	Centre for Ecology Development & Research
CEE	:	Committee on Establishment Expenditure
CoE	:	Centre of Excellence
CGF	:	Clean Ganga Fund
CGWB	:	Central Ground Water Board
CM	:	Chief Minister
CNA	:	Central Nodal Account
COD	:	Chemical Oxygen Demand
CPCB	:	Central Pollution Control Board
CPMU	:	Central Project Management Unit
CSMRS	:	Central Soil and Materials Research Station
CSR	:	Corporate Social Responsibility
CSS	:	Centrally Sponsored Schemes
CWC	:	Central Water Commission
CWRDM	:	Centre for Water Resources Development and Management
CWPRS	:	Central Water and Power Research Station
DDP	:	Desert Development Programme
DoDWS	:	Department of Drinking Water and Sanitation
DFG	:	Demands for Grants
DA&FW	:	Department of Agriculture & Farmers Welfare
DO	:	Dissolved Oxygen
DoWR, RD & GR	:	Department of Water Resources, River Development & Ganga Rejuvenation
DPR	:	Detailed Project Report
DRIP	:	Dam Rehabilitation and Improvement Programme
DVC	:	Damodar Valley Corporation
DWRIS	:	Development of Water Resources Information System
EAP	:	Externally Aided Project Component
EAP	:	Emergency Action Plan

EBR	:	Extra Budgetary Resources
EC	:	Electrical Conductivity
EFC	:	Expenditure Finance Committee
EPC	:	Engineering, Procurement and Construction
FRs	:	Feasibility Reports
FSSM	:	Fecal Sludge and Septage Management
FMBAP	:	Flood Management and Border Areas Programme
FMP	:	Flood Management Programme
FY	:	Financial Year
FR	:	Feasibility Report
GD	:	Gauge & Discharge
GLOF	:	Glacial Lake Outburst Flood
GST	:	Goods and Services Tax
GWM&R	:	Ground Water Management and Regulation
GOI	:	Government of India
Ha	:	Hectare
HDPE	:	High Density Polyethyene
HFL	:	Highest Flood Level
HKKP	:	Har Khet Ko Pani
HO	:	Hydrological Observation
HRD	:	Human Resource Development
IAs	:	Implementing Agencies
ICAR	:	Indian Council of Agricultural Research
IEBR	:	Internal External Budgetary Resources
IIT	:	Indian Institute of Technology
IIHL	:	Individual Household Latrines
ILR	:	Interlinking of Rivers
IOCL	:	Indian Oil Corporation Limites
I.P.	:	Irrigation Potential
ISRWD	:	Inter-State River Water Disputes
ISO	:	International Standards of Organization
IUCN	:	The International Union for Conservation of Nature
JJM	:	Jal Jeevan Mission
JSA	:	Jal Shakti Abhiyan
KLD	:	Kilo Litres Per Day
LA	:	Land Acquisition
LS	:	Lok Sabha
LTIF	:	Long Term Irrigation Fund
MGNREGS	:	Mahatma Gandhi National Rural Employment Guarantee Scheme
MIDH	:	Mission on Integrated Development of Horticulture
MI	:	Minor Irrigation
MLD	:	Million Litres Per Day
MMI	:	Major / Medium Irrigation
MoDW&S	:	Ministry of Drinking Water and Sanitation
MoEF&CC	:	Ministry of Environment, Forest and Climate Change
MoJS	:	Ministry of Jal Shakti
MoWR	:	Ministry of Water Resources
MoWR, RD & GR	:	Ministry of Water Resources River Development and Ganga Rejuvenation

MoU	:	Memorandum of Understanding
NABARD	:	National Bank for Agricultural and Rural Development
NAPCC	:	National Action Plan on Climate Change
NAQUIM	:	National Aquifer Mapping & Management Programme
NBWUE	:	National Bureau of Water Use Efficiency
NCIWRD	:	National Commission on Integrated Water Resources Development
NEWMA	:	North East Water Management Authority
NPV	:	Net Present Value
NGP	:	National Ganga Plan
NGRBA	:	National Ganga River Basin Authority
NHAI	:	National Highways Authority of India
NHP	:	National Hydrology Project
NITI Ayog	:	National Institution for Transforming India Ayog
NMCG	:	National Mission for Clean Ganga
NMSHE	:	National Mission for Sustainable Himalayan Ecosystem
NP	:	National Project
NPP	:	National Perspective Plan
NPMU	:	National Project Monitoring Unit
NRCD	:	National River Conservation Directorate
NRCP	:	National River Conservation Plan
NRIs	:	Non Resident Indians (NRIs),
NWDA	:	National Water Development Agency
NWIC	:	National Water informatics Centre
NWM	:	National Water Mission
NWMP	:	National Water Quality Monitoring Programme
OFD	:	On-Farm Development
ODF	:	Open Defecation Free
O&M	:	Operation and Maintenance
PCCs	:	Pollution Control Committee
PDMC	:	Per Drop More Crop
PIM	:	Participatory Irrigation Management
PIO	:	Persons of Indian Origin
PIP	:	Public Interaction Programmes
PL	:	Price List
PMKSY	:	Pradhan Mantri Krishi Sinchayee Yojana
PMO	:	Prime Minister Office
PPP	:	Public-Private Partnership
PSU	:	Public Sector Undertakings
PWD	:	Public Works Department
RBC	:	Right Bank Canal
RBM	:	River Basin Management
RE	:	Revised Estimate
RISAT	:	Radar Imaging Satellite
RMBA	:	River Management Activities & Works related to Border Areas
RMIS	:	Rationalization of Minor Irrigation Statistics
RRR	:	Repair, Renovation and Restoration
R&D	:	Research and Development
RTDAS	:	Real Time Data Acquisition System
SAR	:	Synthetic Aperture Radar

SCADA	:	Supervisory Control and Data Acquisition
SFC	:	Standing Finance Committee
SNA	:	Single Nodal Account
SMI	:	Surface Minor Irrigation
SPCBs	:	State Pollution Control Boards
SPMU	:	State Project Monitoring Unit
STPs	:	Sewage Treatment Plants
SWM	:	Solid Waste Management
TAMC	:	Technical Assistance and Management Consultancy
TC	:	Technical Committee / Total Coliform
TDS	:	Total Dissolved Solids
TPGVA	:	Third Party Government Verification Agency
UGPL	:	Underground Pipeline
ULBs	:	Urban Local Bodies
UTs	:	Union Territories
UYRB	:	Upper Yamuna River Board
WSPs	:	Water Security Plans
World Bank	:	World Bank
WRD	:	Water Resources Department
WQ	:	Water Quality Stations
WUAs	:	Water User Associations

Report

Part – I

Narration Analysis

Chapter – I

Introductory

1.1 Ground water is the water found underground in the cracks and spaces in soil, sand and rock. It is stored in and moves slowly through geologic formations of soil, sand and rocks called aquifers. Ground water levels in various parts of the country are declining because of continuous withdrawal necessitated by increased demand for freshwater for various uses, vagaries of rainfall, increased population, industrialization and urbanization, etc. Ground water provides 80% of India's rural drinking water, 50% of urban drinking water and nearly two-thirds of irrigation needs. Over the last four decades, around 84% of the total addition to irrigation has come from Ground water. Hence, the availability of Ground water is important for the country to secure the food and water for future generation.

A. Aquifer setting

1.2 India is a vast country with a large number of distinct hydro geological settings. The occurrence and movement of Ground water in various aquifer systems are highly complex due to the occurrence of diversified geological formations with considerable lithological and chronological variations, complex tectonic framework, climatological dissimilarities and various hydro chemical conditions. The country has been broadly divided into five distinct regions viz.

(i) Northern Mountainous Terrain and Hilly areas,
(ii) Indo-Gangetic-Brahmaputra Alluvial Plains,
(iii) Peninsular Shield Area,
(iv) Coastal Area and Cenozoic Fault Basin and
(v) Low Rainfall Areas.

1.3 The Ground water regime shows marked variations in these regions. The highly rugged mountainous terrain in the Himalayan region in the northern part of the country extending from Kashmir to Arunachal Pradesh is characterized by steep slopes and high runoff. Though this area offers very little scope for Ground water storage, it acts as the major source of recharge for the vast Indo-Gangetic and Brahmaputra alluvial plains. The Indo-Ganges-Brahmaputra Alluvial Plains,

covering the States of Punjab, Haryana, Uttar Pradesh, Bihar, Assam and West Bengal has a vast and thick alluvial fill, exceeding 1000 m at places, constituting the most potential and productive Ground water reservoir in the country. Ground water development in this region is still sub-optimal, except in the States of Haryana and Punjab. The deeper aquifers available in these areas offer good scope for further exploitation of Ground water. The Peninsular Shield is located south of Indo-Gangetic-Brahmaputra plains and consist mostly of consolidated sedimentary rocks, *Deccan Trap* basalts and crystalline rocks in the States of Karnataka, Maharashtra, Tamil Nadu, Andhra Pradesh, Orissa and Kerala. Occurrence and movement of Ground water in these formations are restricted to weathered residuum and interconnected fractures at deeper levels and have limited Ground water potential.

1.4 Coastal tracts have a thick cover of alluvial deposit of Pleistocene to Recent age and form potential multi-aquifer systems in the States of Gujarat, Kerala, Tamil Nadu, Andhra Pradesh and Orissa. However, inherent quality problems and the risk of seawater ingress impose severe constraints in Ground water development from these aquifers. The Cenozoic Fault basins have been grouped separately owing to their peculiarity in terms of presence of three discrete fault basins, the *Narmada*, *Purna* and *Tapti* valleys, all of which contain extensive valley fill deposits. The aquifer systems in arid and semi-arid tracts of this region in parts of Rajasthan and Gujarat receive negligible recharge from the scanty rains and the Ground water occurrence in these areas is restricted to deep aquifer systems, most of them tapping fossil water.

B. Management of Ground water Resources

1.5 According to the Department of Water Resources, River Development & Ganga Rejuvenation, Water being a State subject, efforts to conserve and manage Ground water is primarily States responsibility. A number of States have done notable work in this regard. Of these, mention can be made of '*Mukhyamantri Jal Swavlamban Abhiyan'* in Rajasthan, '*Jalyukt Shibar'* in Maharashtra, '*Sujalam Sufalam Abhiyan'* in Gujarat, *'Mission Kakatiya'* in Telangana, and *'Neeru Chettu'* in Andhra Pradesh, '*Jal Jeevan Hariyali'* in Bihar, '*Jal Hi Jeevan'* in Haryana among others.

1.6 It has been also stated that the Government of India has taken various initiatives such as *Jal Shakti Abhiya*n, 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. *Atal Bhujal Yojana* (*ATAL JAL*), a Rs.6000 crore scheme, has been introduced for sustainable management of Ground water with community participation in identified over-exploited and water stressed areas of the States of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. Construction of water harvesting and conservation works is primarily supported by the Central Government through Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and *Pradhan Mantri Krishi Sinchayee Yojana* – Watershed Development Component (PMKSY-WDC).

1.7 In order to regulate the Over-exploitation and consequent depletion of Ground water, the Ministry of Jal Shakti has circulated a Model Bill to all the States/UTs to enable them to enact suitable Ground water legislation for regulation of their development, which includes provision of rain water harvesting. Hon'ble Prime Minister has written a letter to all sarpanchs regarding the importance of water conservation and harvesting and exhorted them to adopt all appropriate measures to make water conservation a mass movement.

1.8 Further, Water being a State subject, initiatives on water management including legislations to address the problem of Ground water contamination in the Country is primarily States' responsibility. In addition to State Governments legislations, Water (Prevention and Control of Pollution) Act, 1974 of MoEFCC, Government of India provides powers to CPCB and SPCB to deal with pollution caused due to discharge of sewage and industrial effluents. Also, the Environment (Protection) Act, 1986 empowers CPCB & SPCB for protection, improvement of environment including addressing environmental pollution from various sources.

1.9 On being asked whether any mechanism has been put in place to ensure a coordinated and synergistic approach with regard to monitoring and outcome of the works/schemes and the role played by CGWB, the DoWR, RD & GR, in their written submission, stated as under:

> *"Major mechanism for coordination and synergy between CGWB and other Ministries/Departments is interaction through various committees at Central and State levels in which CGWB is represented. Ministries and Departments in this regard include Department of Drinking Water & Sanitation, Ministry of Agriculture & Farmers' Welfare, Ministry of Rural Development, Ministry of Environment, Forest & CC, and various State level Technical Advisory Committees and Task forces. Role of CGWB is to provide scientific inputs and technical support as and when required."*

1.10 The Committee however observed that the CWC in their Report "Reassessment of water availability in India using space inputs" published in June, 2019 expressed concern regarding over-exploitation of Ground water. Dwelling on the issue of depleting Ground water, the Report, *inter alia* stated as follows:

> *"Presently, there are over 20 million wells pumping water with free power supply, provided by the Government. This has been depleting Ground water, while encouraging wastage of water in many States. As a result, the water table in the country is dipping every year by 0.4 m. In many coastal areas, there has been heavy intrusion of sea water, making fertile agricultural lands unfit for cultivation."*

1.11 In the present Report, the Committee have examined the problem of depletion of Ground water resources and their contamination, issues relating to overdraft of Ground water in certain areas of the country, judicious utilization of Ground water reserves in those areas which have sufficient capacity, multiplicity of Agencies/Departments involved in dealing with the different aspects of Ground water management, role of individuals/ Groups/ Communities/ Resident Welfare Associations /Non Government Organisations (NGOs) in conservation of Ground water and spreading awareness among masses about the need to use this resource more efficiently. Keeping in view the current disaggregated regulatory approach which lack community ownership of Ground water, the Committee have stressed upon the need for establishing a Centralised agency/body for management of Ground water in a cohesive manner. These issues have been discussed in detail in subsequent chapters.

1.12 During the course of examination of the subject, the Committee obtained a detailed background note on the subject from the Ministry of Jal Shakti –DoWR, RD & GR and also took evidence of the representatives of the Department. Besides, the representatives of Ministry of Agriculture & Farmers' Welfare –DA&FW, Ministry of Rural Development - Department of Land Resources and Department of Rural Development, Ministry of Power, Ministry of Environment, Forest and Climate Change and Ministry of Housing and Urban Affairs were also called before the Committee to understand and appreciate the various aspects of the issue. For questions which needed further clarifications after evidence, post evidence reply were obtained from the above Ministries/Departments.

Chapter –II

Ground Water Depletion - Problems and issues

2.1 Overuse or overexploitation of Ground water is defined as a situation in which, over a period of time, average extraction rate from aquifers is greater than the average recharge rate. In India, the availability of Surface water is greater than Ground water. However, owing to the decentralised availability of Ground water, it is easily accessible and forms the largest share of India's agriculture and drinking water supply.

A. Assessment of Ground water resource

2.2 The DoWR, RD & GR has informed that Ground water is a replenishable resource and rainfall is the major source of Ground water recharge, which is supplemented by other sources such as recharge from canals, irrigated fields and Surface water bodies. A major part of the Ground water withdrawal takes place from the shallow unconfined aquifers, which are also the active recharge zones and holds the dynamic Ground water resource. The dynamic Ground water resource in the active recharge zone in the country has been assessed by Central Ground water Board jointly with the concerned State Government Authorities.

2.3 It has also been stated that Ground water situation in India is rapidly becoming grim due to excessive extraction, which in turn is shrinking their supply, emptying aquifers resulting in the increased risk of contamination and consequent adverse impact on environment and ecology. India is the largest user of Ground water in the world and accounts for 25 percent of global withdrawals. Ground water provides for 67 percent of irrigation needs and 80 percent of drinking water needs of the country.

(i) **Methodology**

2.4 The MoEF&CC has informed the Committee that in 1982, the Government of India constituted 'Ground water Estimation Committee' (GEC) drawing Members from various States / Central organizations engaged in hydro geological studies and Ground water development which suggested a methodology for the assessment of dynamic Ground water resources in 1984, commonly referred to as GEC'84. As per the recommendations of the GEC'84, total replenishable Ground water in India in 1995 was estimated to be about 432 BCM. The Net Ground water Draft (The Ground water draft is the quantity of Ground water withdrawn artificially) from

Irrigation use was around 115 BCM and the level of development was 32%. Utilizable Irrigation Potential from Ground water of the country was worked out to be 64 million hectare.

2.5 The methodology recommended by 'Ground Water Resource Estimation Committee -2015 (GEC-2015)' is the current methodology adopted for Ground Water Resource Assessment. Based on the methodology "India - Groundwater Resource Estimation System (IN-GRES)" is a software/web-based application developed by CGWB in collaboration with IIT-Hyderabad. It has provided common and standardized platform for Ground Water resource estimation for the entire country and their pan-India operationalization (Central and State Governments). The latest Ground Water Resource Assessment (2020) has been successfully carried out using "IN-GRES" Software.

(ii) **Dynamic Ground Water Resources**

2.6 It has been stated by the Department that the Dynamic Ground Water resources (as in 2020) of the entire country have been assessed jointly by CGWB and State Ground Water Departments under the supervision of the State level Committees. The dynamic Ground Water resources are also known as Annual Ground Water Recharge, since it gets recharged every year from rainfall and other sources (secondary sources) such as applied irrigation water, surface water bodies, water conservation structures, etc.

2.7 When asked to furnish the details of latest assessment of Ground Water resources, the Department, in their reply to supplementary lop, informed as under:

> *"As per the 2020 assessment of Dynamic Ground Water Resources, the Total Annual Ground Water Recharge for the entire country has been assessed as 436.15 BCM. The Annual Extractable Ground Water Resources for the entire country is 397.62 BCM. State-wise Ground Water Resources of India (as in 2020) are given below:*

State-Wise Ground Water Resources of India, 2020 (in BCM)

S. No.	States / Union Territories	Total Annual Ground water Recharge	Total Natural Discharges	Annual Extractable Ground water Resource	Current Annual Ground water Extraction				Stage of Ground water Extraction (%)
					Irrigation	Industrial	Domestic	Total	
	States								
1	**Andhra Pradesh**	24.15	1.21	22.94	6.60	0.15	0.88	7.63	33.26
2	**Arunachal Pradesh**	3.19	0.27	2.92	0.003	0.0002	0.01	0.01	0.36
3	**Assam**	27.05	5.09	21.97	1.97	0.01	0.60	2.58	11.73
4	**Bihar**	28.05	2.60	25.46	10.33	0.65	2.04	13.02	51.14
5	**Chhattisgarh**	12.65	1.11	11.55	4.53	0.10	0.71	5.35	46.34

6	**Delhi**	0.32	0.03	0.29	0.07	0.04	0.18	0.29	101.40
7	**Goa**	0.40	0.08	0.32	0.02	0.004	0.05	0.08	23.48
8	**Gujarat**	26.81	1.90	24.91	12.65	0.03	0.62	13.30	53.39
9	**Haryana**	9.53	0.90	8.63	10.47	0.53	0.62	11.61	134.56
10	**Himachal Pradesh**	1.07	0.10	0.97	0.20	0.05	0.10	0.36	36.83
11	**Jharkhand**	6.15	0.51	5.64	0.93	0.20	0.51	1.64	29.13
12	**Karnataka**	18.16	1.76	16.40	9.50	0.00	1.03	10.63	64.85
13	**Kerala**	5.65	0.53	5.12	1.16	0.01	1.47	2.65	51.68
14	**Madhya Pradesh**	36.16	2.78	33.38	17.33	0.03	1.61	18.97	56.82
15	**Maharashtra**	32.01	1.76	30.25	15.29	0.003	1.34	16.63	54.99
16	**Manipur**	0.51	0.05	0.46	0.003	0.0002	0.02	0.02	5.12
17	**Meghalaya**	2.04	0.22	1.82	0.03	0.0003	0.05	0.08	4.22
18	**Mizoram**	0.22	0.02	0.20	0.00	0.00	0.01	0.01	3.81
19	**Nagaland**	2.17	0.22	1.95	0.002	0.00003	0.02	0.02	1.04
20	**Odisha**	17.08	1.37	15.71	5.50	0.15	1.21	6.86	43.65
21	**Punjab**	22.80	2.20	20.59	32.80	0.00	1.05	33.85	164.42
22	**Rajasthan**	12.24	1.17	11.07	14.37	0.13	2.14	16.63	150.22
23	**Sikkim**	0.96	0.10	0.86	0.00	0.002	0.01	0.01	0.86
24	**Tamil Nadu**	19.59	1.90	17.69	13.52	0.17	0.99	14.67	82.93
25	**Telangana**	16.63	1.60	15.03	7.13	0.14	0.73	8.01	53.32
26	**Tripura**	1.47	0.22	1.24	0.02	0.0002	0.08	0.10	7.94
27	**Uttar Pradesh**	2	5.32	66.88	41.29	0.00	4.74	46.03	68.83
28	**Uttarakhand**		0.17	1.85	0.63	0.09	0.15	0.87	46.80
29	**West Bengal**	29.33	2.77	26.56	10.84	0.27	0.73	11.84	44.60
	Union Territories								
30	**Andaman & Nicobar**	0.37	0.03	0.28	0.0001	0.001	0.01	0.01	2.60
31	**Chandigarh**	0.06	0.01	0.06	0.01	0.002	0.03	0.05	80.60
32	**Dadra & Nagar Haveli**	0.07	0.005	0.07	0.01	0.01	0.02	0.03	45.99
	Daman & Diu	0.03	0.001	0.03	0.003	0.03	0.00	0.03	113.38
33	**Jammu & Kashmir**	4.58	0.46	4.22	0.20	0.13	0.56	0.89	21.03
34	**Ladakh**	0.12	0.01	0.11	0.001	0.0002	0.02	0.02	17.90
35	**Lakshdweep**	0.01	0.01	0.005	0.00	0.00	0.003	0.003	58.47
36	**Puducherry**	0.22	0.02	0.20	0.10	0.01	0.05	0.15	74.27
	Grand Total	**436.15**	**38.51**	**397.62**	**217.61**	**2.94**	**24.37**	**244.92**	61.60
	Note:								
	Data on Ground Water Extraction for industries is not available for Karnataka, Punjab and Uttar Pradesh and is available only for 2 districts of Maharashtra.								
	The Ground water resources assessment as on 2013 has been considered for the state of West Bengal								

2.8 Asked further about the trend of Ground water table during the last 10 years, the Department, in their reply to supplementary list of points stated as under:

"Details of Ground Water Resources of India assessed during past 10 years (2011, 2013, 2017 and 2020) are given below. The assessment of Ground Water resources takes into consideration the Ground Water level information.

S. No.	Ground Water Resources Assessment	2011	2013	2017	2020
1	Annual Ground Water Recharge	433 bcm	447 bcm	432 bcm	436 bcm
2	Annual Extractable Ground Water Resource	398 bcm	411 bcm	393 bcm	398 bcm
3	Annual Ground Water Extraction for Irrigation, Domestic & Industrial uses	245 bcm	253 bcm	249 bcm	245 bcm
4	Stage of Ground Water Extraction	61.55 %	61.55 %	63.3 %	61.6 %

(iii) **Stage of Extraction**

2.9 The Committee has been informed that Stage of Extraction (SoE) is the ratio of 'Annual Ground Water Extraction' for all uses with 'annual extractable Ground

Water resources' expressed in terms of percentage. The overall stage of Ground Water extraction in the country is 61.6 % as per 2020 assessment. The assessment units (blocks/taluks/mandals/tehsil/firkas etc.) are categorized based on the Stage of Extraction (SoE) as 'Safe' if SoE < 70 %; 'Semi-critical if SoE > 70 and <= 90 %; 'Critical' if SoE >90 and <=100 % and 'Over-exploited' if SoE> 100 %. Assessment unit in which the Ground Water resources are entirely saline, have been categorised as 'Saline'.

2.10 As per assessment, 2020; Out of the 6,965 assessment units (Blocks/ Taluks/ Mandals/ Districts/Firkas/Valleys), 1,114 have been categorized as 'Over-exploited'. Details of Categorization of Assessment Units of India assessed during past 10 years (2011, 2013, 2017 and 2020) are given below:

S. No.	Categorization of Blocks/ Mandals/ Talukas	2011	2013	2017	2020
1	Total Assessed units	6,607	6,584	6,881	6,965
2	Over-Exploited	1,071	1,034	1,186	1,114
	In %age terms	16.21	15.7	17.23	15.99

2.11 There is overall decrease in number of over-exploited assessment units of India in 2020 (15.99 % of the assessment units) as compared to last assessment in 2017 (17.23 % of the assessment units).

2.12 In some areas of the country, good rainfall and Ground Water management practices through Government and private initiatives like creation of recharge structures through various schemes/CSR funds, implementation of conservation measures like crop rotation, crop diversification, installation of drip/sprinkler systems, awareness generation through Jal Shakti Abhiyan etc may have resulted in improvement in Ground Water situation.

2.13 State-wise Categorization of Assessment Units (as in 2020) are given in the table below:

Categorization of Blocks/ Mandals/ Talukas In India (2020)

S.No.	States / Union Territories	Total No. of Assessed Units	Safe		Semi-Critical		Critical		Over-Exploited		Saline	
			Nos.		Nos.	%	Nos.	%	Nos.	%	Nos.	%
	States											
1	Andhra Pradesh	667	551	82.61	40	6	15	2.25	23	3.45	38	5.70
2	Arunachal Pradesh	11	11	100	0	0	0	0	0	0	0	0

3	**Assam**	28	28	100	0	0	0	0	0	0	0	0
4	**Bihar**	534	471	88.20	51	9.55	5	0.94	7	1.31	0	0
5	**Chattisgarh**	146	110	75.34	27	18.49	9	6.16	0	0	0	0
6	**Delhi**	34	3	8.82	7	20.59	**7**	20.59	17	50	0	0
7	**Goa**	12	12	100			0	0	0	0	0	0
8	**Gujarat**	248	182	73.39	24	9.68	4	1.61	25	10.08	13	5.24
9	**Haryana**	141	30	21.28	14	9.93	12	8.51	85	60.28	0	0
10	**Himachal Pradesh**	10	10	100	0	0	0	0	**0**	**0**	0	0
11	**Jharkhand**	259	244	94.21	10	3.86	2	0.77	3	1.16	0	0
12	**Karnataka**	227	130	57.27	35	15.42	10	4.41	52	22.91	0	0
13	**Kerala**	152	120	78.95	29	19.08	3	1.97	0	0	0	0
14	**Madhya Pradesh**	317	233	73.50	50	15.77	8	2.52	26	8.21	0	0
15	**Maharashtra**	353	271	76.77	63	17.85	8	2.27	10	2.83	1	0.28
16	**Manipur**	9	9	100	0	0	0	0	0	0	0	0
17	**Meghalaya**	12	12	100	0	0	0	0	0	0	0	0
18	**Mizoram**	26	26	100	0	0	0	0	0	0	0	0
19	**Nagaland**	11	11	100	0	0	0	0	0	0	0	0
20	**Odisha**	314	302	96.18	6	1.91	0	0	0	0	6	1.91
21	**Punjab**	150	17	11.33	10	6.67	6	4	117	78.00	0	0
22	**Rajasthan**	295	37	12.54	29	9.83	23	7.80	203	68.81	3	1.02
23	**Sikkim**	4	4	100	0	0	0	0	0	0	0	0
24	**Tamil Nadu**	1166	409	35.08	225	19.30	63	5.40	435	37.31	34	2.92
25	**Telangana**	589	321	54.50	180	30.56	44	7.47	44	7.47	0	0
26	**Tripura**	59	59	100	0	0	0	0	0	0	0	0
27	**Uttar Pradesh**	830	541	65.18	174	20.96	49	5.90	66	7.95	0	0
28	**Uttarakhand**	18	14	77.78	4	22.22	0	0	0	0	0	0
29	**West Bengal***	268	191	71.27	76	28.36	1	0.37	0	0	0	0
30	**Andaman & Nicobar**	36	35	97.22	0	0	0	0	0	0	1	2.78
31	**Chandigarh**	1			1	100	0	0	0	0	0	0
32	**Dadra & Nagar Haveli**	1	1	100	0	0	0	0	0	0	0	0
	Daman & Diu	2	1	50	0	0	0	0	1	50	0	0
33	**Jammu and Kashmir**	20	20	100	0	0	0	0	0	0	0	0
34	**Ladakh**	2	2	100	0	0	0	0	0	0	0	0
35	**Lakshdweep**	9	7	77.78	2	22.22	0	0	0	0	0	0
36	**Puducherry**	4	2	50	0	0	1	25	0	0	1	25
	Grand Total	**6965**	**4427**	**63.56**	**1057**	**15.18**	**270**	**3.88**	**1114**	**15.99**	**97**	**1.39**

Note

Blocks- Bihar, Chhattisgarh, Haryana, Jharkhand, Kerala, M.P., Manipur, Mizoram, Orissa, Punjab, Rajasthan, Tripura, Uttar Pradesh, Uttarakhand, West Bengal

Taluks -Karnataka, Goa, Gujarat, Maharashtra

Mandals- Andhra Pradesh, Telangana

Districts - Arunachal Pradesh, Assam, , Jammu & Kashmir, Meghalaya, Mizoram, Nagaland

Valley - Himachal Pradesh

Islands - Lakshadweep, Andaman & Nicobar Islands

Firka-Tamil Nadu

Region - Puducherry

UT - Chandigarh,

Tehsil-NCT Delhi

***West Bengal:** The Ground water resources assessment as on 2013 has been considered for the State of West Bengal

2.14 The stage of Ground Water Extraction is very high in the States of Delhi, Haryana, Punjab and Rajasthan, where it is more than 100%, which implies that in these States the Annual Ground Water Consumption is more than annual extractable Ground Water resources. In the States of Tamil Nadu, Uttar Pradesh, Karnataka and UTs of Chandigarh and Puducherry, the stage of Ground Water Extraction is between 60-100%. In rest of the States, the stage of Ground Water extraction is below 60 %.

2.15 The percentage of Over-exploited and Critical administrative units which are more than 25% of the total units are in Delhi, Haryana, Karnataka, Punjab, Rajasthan, Tamil Nadu. Further Out of 24.33 lakh sq km recharge worthy area of the country, 4.09 lakh sq km (17 %) are under 'Over-Exploited', 0.86 lakh sq km (4 %) are under 'Critical', 3.4 lakh sq km (14 %) are under 'Semi-Critical', 15.67 lakh sq km (64 %) are under 'Safe' and 0.3 lakh sq km (1 %) are under 'Saline' category assessment units.

2.16 State-wise improvement/deterioration in Assessment units in the Ground Water resource assessment 2020 as against 2017 is as given below:

State-Wise Summary Of Assessment Units Improved Or Deteriorated From 2017 To 2020 Assessment

S. No.	Name of States / Union Territories	Number of Assessment Units Improved	Number of Assessment Units Deteriorated	Number of Assessment Units With No Change
1	Andhra Pradesh	94	23	550
2	Arunachal Pradesh	Nil	Nil	11
3	Assam	Nil	Nil	28
4	Bihar	61	9	464
5	Chhattisgarh	2	19	125
6	Delhi	8	3	23
7	Goa	Nil	Nil	12
8	Gujarat	16	22	210
9	Haryana	13	15	113
10	Himachal Pradesh	5	Nil	5
11	Jharkhand	4	8	247
12	Karnataka	7	3	117
13	Kerala	3	1	148
14	Madhya Pradesh	3	16	294
15	Maharashtra	5	3	345
16	Manipur	Nil	Nil	9
17	Meghalaya	Nil	Nil	12
18	Mizoram	Nil	Nil	26
19	Nagaland	Nil	Nil	11
20	Odisha	1	2	311
21	Punjab	5	11	122
22	Rajasthan	10	40	245
23	Sikkim	Nil	Nil	4
24	Tamil Nadu	98	65	1003
25	Telangana	160	90	334

26	Tripura	Nil	Nil	59
27	Uttar Pradesh	77	31	722
28	Uttarakhand	1	0	17
29	West Bengal*			
30	Andaman and Nicobar	Nil	Nil	36
31	Chandigarh	Nil	Nil	1
31	Dadra & Nagar Haveli	Nil	Nil	1
	Daman & Diu	1	1	Nil
32	Jammu and Kashmir	Nil	Nil	20
33	Lakshadweep	1	Nil	8
34	Puducherry	1	Nil	3
35	Ladakh	Nil	Nil	2
	Grand Total	576	362	5638
Note *In the State of West Bengal, the Ground Water Resources of 2013 is considered				

2.17 The Committee have been informed that as per assessment 2020, the total annual Ground Water recharge for the country is 436.15 BCM, which is 4.29 BCM more as compared to the 2017 assessment (431.86 BCM). Increase in Ground Water recharge is attributed mainly to increase in recharge from 'other sources' i.e. from return flow of irrigation water, recharges from water bodies/tanks and water conservation structures etc. The major contributions in increase in recharge are from Gujarat, Telangana, Andhra Pradesh, Uttar Pradesh States. As the Ground Water recharge has increased in 2020, the Annual Extractable Ground Water Resources (subtraction of natural discharge from recharge) has also increased in 2020 as compared to 2017.

2.18 The Annual Ground Water Extraction has been assessed as 244.92 BCM (year 2020) which indicates reduction of approximately 3.77 BCM as compared to the 2017 assessment (248.69 BCM). Increased availability of Surface Water for irrigation/domestic water supply and improved water use efficiency are the likely reasons for reduction in Ground Water extraction.

2.19 The average 'Stage of Extraction' for the country as a whole works out to be 61.6 % showing a reduction by 1.7 % as compared to 2017 (63.33%), indicating overall improvement in the Ground Water scenario.

(iv) **Decadal fluctuation in Ground water level during the period 2010-19**

2.20 The DoWR, RD & GR has stated that in order to assess the decline in water level on a long-term basis, Pre-monsoon water level data collected by CGWB during pre-monsoon 2020 has been compared with the decadal average (2010-2019). Analysis of water level data indicates that about 37% of the wells monitored have registered decline in Ground water levels, mostly in the range of 0 – 2 m.

Decline of more than 4 m has also been observed in pockets of most of the States/ UTs except Arunachal Pradesh, Bihar, Daman & Diu, Himachal Pradesh, Jharkhand, Meghalaya, Nagaland and Tripura. The States/UTs where more than 10% of monitoring wells show decline of more than 4m are –Andhra Pradesh, Chandigarh, Delhi, Haryana, Punjab, and Rajasthan.

2.21 It is also stated that during the pre-monsoon period of 2020, the depth to water level in the country ranged from less than 2 to more than 40 metres BGL. In a major part of the country, water level is in the range of 5 to 10 m. Very shallow water level of less than 2 m BGL is also observed locally, in isolated pockets in all States and UTs. In major parts of North-Western and Western States, depth to water level is generally deeper and ranges from about 10 to 40 m BGL. The deeper Ground water level (more than 40 meters BGL) has been observed in the isolated pockets of Andhra Pradesh, Chandigarh, Delhi, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Telangana, Uttar Pradesh and Uttarakhand.

(v) **Digitisation of Ground water assessment process**

2.22 The Ministry of Jal Shakti has decided to digitise the Ground water assessment process in collaboration with IIT Hyderabad. The software development in this regard is in final stage of development with IIT Hyderabad. The software will tremendously reduce the time period for finalization of assessment of Ground water resources in the country and the output shall be free from human error. In addition, the software shall lead to application of uniform methodology pan-India as far as final resource estimation is concerned.

(vi) **Ground Water use in different sectors**

2.23 The Committee have been informed that the Total Annual Ground Water Extraction of the entire country for the year 2020 has been estimated as 244.92 BCM. Agriculture sector is the predominant consumer of Ground Water resources. About 89% of total annual Ground Water extraction i.e. 217.61 BCM is for irrigation. Only 27.3 BCM is for domestic & industrial use, which is about 11% of the total extraction. There is overall decrease in Ground Water extraction in 2020 as compared 2017.

2.24 Punjab and Telangana are two major States which appear to contribute for overall reduction in Ground Water extraction. Decreased extraction is primarily due to decrease in area/type of paddy cultivation based on Ground Water in Punjab. Reduction in Ground Water extraction in Telangana mainly can be attributed to

Government interventions like water conservation activities under Mission Kakatiya, improvement in Surface Water irrigation and drinking water supply under Mission Bhagiratha etc.

B. Real time monitoring of availability of Ground water.

2.25 Under the National Hydrology Project (NHP), the Ground water monitoring networks are being further enhanced by the Central and State Implementing Agencies across India for improving real-time monitoring of Ground water. Simultaneously a web-based centralized Water Information Management Systems (WIMS) is being developed for dissemination of time series and spatial data on real time basis to the stakeholders. Conventionally, Ground water levels are monitored four times a year manually and water quality samples are collected once a year to obtain background information of Ground water quality changes on regional scale. However, under NHP, the real time stations would be acquiring data on six hourly basis and with transmission once a day.

2.26 It is also stated that for real time monitoring of Ground water levels and quality at selected locations, Digital Water Level Recorder (DWLR) along with GPRS/GSM based Telemetry system are being installed at representative piezometer locations across the country. Most of the DWLRs are being installed at existing piezometer locations whereas some are proposed to be installed on new piezometers being constructed under NHP. Overall more than 10000 DWLRs are planned to be installed under NHP. CGWB has already floated tender for installation of DWLRs with telemetry at 3400 locations in the over exploited/critical blocks in the States of Jammu & Kashmir, Punjab, Haryana, UT of Chandigarh, Uttarakhand, UT of Delhi, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Arunachal Pradesh, Assam, Meghalaya, Nagaland, Tripura, Orissa, Madhya Pradesh, Chhattisgarh, Rajasthan, Gujarat, UT of Diu, Maharashtra, Karnataka, Kerala, Tamil Nadu, UT of Puducherry, Andhra Pradesh & Telangana. The tender is under final stage of evaluation.

2.27 Real time data from these DWLR locations would be transmitted to centralized data base as well as State level data centers and shall be accessible to general public through India-WRIS web-site.

2.28 When asked about the time period required to install the (DWLR) along with GPRS/GSM based Telemetry system, the DoWR, RD & GR stated following in their written reply:

"Majority of the DWLR are scheduled to be installed by Mar 2023. However, balance DWLRs which may be planned based on specific recommendation of the studies in this regard may be completed by Mar 2024."

C. Decline in Ground water level in Metros and Cities

2.29 According to the MoHUA, the analysis of the Ground water level data of 51 Urban Areas of the Country measured during the Pre-monsoon 2020 indicates that out of the total 923 wells analysed, 57 (6%) wells are showing water level less than 2 m BGL, 176 (19%) wells are showing water level in the depth range of 2-5 m BGL, 262 (28 %) wells are showing water level in the depth range of 5-10 m BGL, 208 (23%) wells are showing water level in the depth range of 10-20 m BGL, 159 (17%) wells are showing water level in the depth range of 20-40 m BGL and the remaining 61 (7%) wells are showing water level more than 40 m BGL. Deeper Water level of more than 20 m BGL is observed in Delhi, Kolkata, Hyderabad, Ahmedabad, Gwalior, Ludhiana, Amrtheirar, Faridabad, Chandigarh, Coimbatore, Vijaywada, Vishakhapatnam, Vadodara, Jaipur, Jodhpur, Allahabad, Ghaziabad, Kanpur, Agra, Lucknow, Meerut, Varanasi and Dehradun.

2.30 When asked about the Ground water level in Urban areas of the country, as per the 2020 assessment, the Department, in reply to Supplementary list of points, informed as under:

"As a part of the recent assessment for the year 2020, dynamic resources of 67 urban assessment units in seven States has been done. In the previous assessment (2017) 63 assessment units in 6 States were assessed as urban units. Comparison of the urban assessment units as assessed during 2017 and 2020 reveals change in the status only in respect of the urban assessment units of Delhi. Out of 34 urban assessment units in Delhi, there were 22 assessment units categorized under OE category in 2017 which reduced to 17 assessment units in the year 2020. However, there was increase in the number of assessment units under critical category from 2 in 2017 to 7 in 2020. The number of safe and semi-critical assessment units remained same as 3 and 7 in both the assessments. Further, in the year 2020, four urban assessment units in the State of Madhya Pradesh have been assessed for the first time. The State wise comparison of the status of urban assessment units as per 2017 and 2020 assessment are provided below.

S.No	***State***	***Total no. of Urban Assessment Units assessed separately***	***Categorization as per 2017 assessment***	***Categorization as per 2020 assessment***
1.	*Delhi*	*34*	*Over-exploited-22 Critical-2 Semi-critical-7*	*Over-exploited-17 Critical-7*

			Safe-3	*Semi-critical-7* *Safe-3*
2.	*Telangana*	*16*	*Over-exploited-16*	*Over-exploited-1*
3.	*Uttar Pradesh*	*10*	*Over-exploited-9* *Critical-1*	*Over-exploited-9* *Critical-1*
4.	*Madhya Pradesh*	*4 (Assessed separately as urban units only in 2020)*	*Not assessed as urban units in 2017*	*Over-exploited-1* *Critical-1* *Semi-critical-2*
5.	*Andhra Pradesh*	*1*	*Safe-1*	*Safe-1*
6.	*Assam*	*1*	*Safe-1*	*Safe-1*
7.	*Chandigarh*	*1*	*Semi-critical-1*	*Semi-critical-1*
	Total	***67*** *(Note: In the year 2017 only 63 Urban assessment units were assessed)*	***Over-exploited-47*** ***Critical-3*** ***Semi-critical-8*** ***Safe-5***	***Over-exploited-43*** ***Critical-9*** ***Semi-critical-10*** ***Safe-5***

D. Effect of change in land use on Ground water recharge

2.31 To a specific query as to whether change in land use in cities and metros, has in any way significantly affected Ground water recharge and the measures that have been taken to monitor such changes in land use, the MoHUA, in their post evidence reply, stated as under:

> *"MoHUA and CWGB has not carried out any specific study on effect of changing land use on Ground water recharge. However, it is a fact that rapid urbanisation reduces the permeable land area needed for the natural recharge to Ground water. Most Ground water originates directly from excess rainfall infiltrating the land surface. Thus land use has a major influence on both Ground water quality and recharge rates. Different land-use practices leave distinctive signatures on the quality of Ground water recharge and, in some instances; result in diffusing Ground water pollution, irrespective of climatic conditions."*

2.32 When further asked to provide information regarding the percentage share of Ground water vis-a-vis other water resources in the overall water requirements in Urban areas, the MoHUA, in their post evidence reply, stated as under:

> *"The major sources of water are both the Surface water and the Ground water. The Surface water includes river, reservoir and the tanks. As reported by CGWB in "Report of The Ground Water Resource Estimation Committee (GEC-2015)", 50% of urban water usage is Ground water and the rest 50% is from other sources. CGWB has informed that as per the information received from the respective State Departments, the percentage share of Ground water in water supply for the mentioned cities are given below:*

Sl. No.	***Major cities***	*Percentage share of Ground water in water supply*
1.	*Delhi*	*9%*

2.	*Kolkata*	*25%*
3.	*Hyderabad*	*16%*
4.	*Ludhiana*	*100%*
5.	*Amritsar*	*100%*
6.	*Faridabad*	*100%*
7.	*Chandigarh*	*40%*
8.	*Jaipur*	*15%*
9.	*Jodhpur*	*10%*
10.	*Ghaziabad*	*71%*
11.	*Agra*	*12%*
12.	*Dehradun*	*80%*
13.	*Vadodara*	*3%*
14.	*Vishakapatnam*	*28%*

2.33 To a further query regarding the percentage of use of tankers for catering to water needs of the urban areas including cities and metros and share of Ground water in such tankers supplying water, the MoHUA, in their post evidence reply, stated as under:

"Information regarding water supply to households through tanker has not been maintained in the Ministry of Housing and Urban Affairs."

E. Ground Water management in cities under Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

2.34 Elaborating on the measures taken for sustainable management of Ground water in urban areas, the MoHUA, in their Background Note stated as follows:

(a) *"AMRUT focuses on development of basic urban infrastructure in the selected cities in the sectors of Water Supply; Sewerage & Septage Management; Storm Water Drainage; Non-Motorised Public Transport; and Permeable Green Spaces & Parks. The Mission launched on June 25, 2015, in 500 selected cities across the country covering about 22.50 crore population (60% of the Urban Population) as per census 2011 was up to March, 2020 which has been extended up to March, 2021. Components of AMRUT, which are helpful in Ground water conservation, are following:*

(i) Water Supply sector under AMRUT includes taking up projects on new water supply system, augmentation and rehabilitation of existing water supply system and rejuvenation of water bodies etc.

(ii) Rejuvenation of Water Bodies is one of the admissible component under water supply in AMRUT. Currently, 63 water bodies have been rejuvenated under AMRUT water supply projects.

(iii) Rain Water Harvesting: Currently, 8 Rain Water Harvesting projects worth Rs 11 crore have been grounded across 5 AMRUT cities (4 States/UTs). Of these, 4 projects have already been completed.

(iv) *Sewerage & Septage Management sector under AMRUT includes decentralised, networked underground sewerage systems, including augmentation of existing sewerage systems and sewage treatment plants; rehabilitation of old sewerage system and treatment plants; and recycling of waste water and reuse of treated water for industrial /horticulture purpose. Recycle and reuse of waste water reduces the consumption of fresh water, which shall in turn improve the Ground Water deposit. Sewerage & Septage Management components also help in preventing contamination of Surface and Ground Water.*

(v) *Few cities have taken such reuse/recycle projects under AMRUT for supplying it to industries. For example, two tertiary treatment plants of 45 MLD each based on Reverse Osmosis have been established at Kodungaiyur and Koyambedu, Tamil Nadu generating revenue of Rs.16 crore/year through sale of treated water to nearby petrochemical and fertilizer industries. Another tertiary treatment plant project at Surat, Gujarat producing bio-gas worth 6,329 KWH/day supplies treated waste water to nearby industries.*

(vi) *Centralized control and monitoring of water supply & sewerage system using smart technology: Cities have adopted Supervisory Control and Data Acquisition (SCADA) system under AMRUT projects for better management of city infrastructure. 230 Water Supply projects and 145 Sewerage projects are implemented with SCADA system. SCADA in Water Supply system will help towards non-revenue water reduction in our cities.*

(vii) *Parks and Permeable Green Spaces developed under AMRUT are also very important to improve water security as parks and green spaces provide permeable surface in the city to capture rainwater and improve groundwater level. In the Green Spaces &Parks sector, 1,772 projects out of 2537 projects have been completed so far.*

(viii) *Storm Water Drainage sector under AMRUT include construction and improvement of drains and storm water drains in order to reduce and eliminate flooding. The runoff water is stored in retention basins for a certain time to recharge ground water and to use the collected water for irrigation or household supply. In the storm water drainage sector, 486 projects out of 772 projects have been completed so far.*

(b) *Smart Cities Mission (SCM) was launched on 25 June 2015 with the objective of promoting smart cities that provide core infrastructure and give a decent quality of life to their citizens, a clean and sustainable environment and application of Smart Solutions. Under the SCM, 100 Smart Cities have been selected in 4 Rounds based on All India Competition. Initiatives taken in the Mission cities to address water crisis, include installation of smart water meters, providing house service connections, upgradation of water supply systems, interlinking of water network data with SCADA system, waste water and sewage management, ground and underground water management including water harvesting etc.*

(c) *Swachh Bharat Mission (Urban): One of the major sources of contamination of ground water is discharge of leachate from insanitary landfill. Hazardous chemicals can reach into ground water through precipitation and runoff. Sanitary landfills are required to be lined with clay or another synthetic material with leachate treatment facilities to prevent the contamination of surface as well as ground water. SBM(U) is being implemented in all urban areas with an objective to make country's urban area open defecation free (ODF) with the construction of individual toilets, community and public toilets along with urinals and 100% scientific waste management includes 100% door-to-door collection & segregation of waste and their scientific processing to minimize the waste transporting to the landfill site. Under SBM(U), municipal solid waste collection efficiency has been increased to 97% and the waste processing capacity is created at 68% as against the waste generation of 1,42,755 MT/ Day.*

(d) *Guidelines /Manuals issued by the Ministry of Housing and Urban Affairs:*

Ministry of Housing & Urban Affairs has formulated various guidelines/ Model bye laws for the States for their adoption suiting local conditions. These guidelines inter alia promote water conservation in the cities resulting in ground water recharging and less exploitation of groundwater. The guidelines/ bye-laws are the following:

(i) Unified Building Bye Laws (UBBL) of Delhi, 2016 & Model Building Bye Laws (MBBL), 2016
(ii) Urban and Regional Development Plan Formulation and Implementation (URDPFI) Guidelines, 2014
(iii) Manual on Rain Water Harvesting & Conservation, 2019
(iv) Manual on Storm Water Drainage Systems – 2019
(v) Guidelines for Urban Water Conservation – 2019

(e) *Under Jal Shakti Abhiyan, MoHUA promulgated activities such as Rain Water Harvesting (RWH), reuse of treated waste water, rejuvenation of water bodies and intensive plantation for which detailed guidelines have been issued by the Ministry."*

2.35 Asked to state the measures taken to reduce overdependence on Ground water and to augment the water availability and supply through Surface and other water resources, the MoHUA, in their post evidence reply, *inter alia* stated as under:

"The Surface water sources for all usage including irrigation, drinking water for urban and rural areas and industries are being augmented by construction of storage reservoir, dams, lakes etc by the CWC.
Under AMRUT, States / Union Territories have taken up 1,349 water supply projects, of which 404 projects would draw water from Surface water sources.
States have also taken up water bodies rejuvenation projects which will augment the availability of Surface water."

2.36 When asked to furnish the details of the total amount of expenditure vis-a-vis fund allocation for water supply projects under AMRUT along with details of delays,

if any, in execution of these projects, the MoHUA, in their post evidence reply, stated as under:

> *"The total allocation for water supply projects is ₹39,011 crore, but States/ UTs have taken projects worth ₹42,659 core. So far, cumulative expenditure incurred on water supply projects amount to ₹22,028 crore. The water supply projects are large infrastructure projects having long gestation period. Therefore, water supply projects take more time to complete than other projects. In addition, completion of some of the water supply projects have got delayed due to the following reasons:*
>
> *(a) Monsoons and natural calamities like floods hampered planning and physical progress in some of the States.*
>
> *(b) The delay in grant of required clearances from other departments such as NHAI and Railways.*
>
> *(c) The national lockdown imposed due to COVID-19 pandemic, frequent local lockdowns and resulting labour shortage between April 2020 to August 2020.*
>
> *Under AMRUT, in the Water Supply sector, 565 projects out of 1349 projects have been completed so far."*

2.37 On being asked about the feasibility of completion of remaining projects within targeted date, the MoHUA, in their post evidence reply, stated as under:

> *"As on 10 February 2021, total 1,349 water supply projects worth ₹42,569 crore have been taken up by States /UTs under AMRUT. Of these, work has been completed for 580 projects worth ₹8,682 crore, whereas 736 projects worth ₹32,951 crore are work in progress and 21 projects worth ₹533 crore are under tendering process. Further, DPRs of another 12 projects worth ₹400 crore have got approved, which are to be tendered. The grounded projects are likely to be completed by March, 2023."*

2.38 When asked as to whether there is any proposal to extend the ambit of AMRUT to more cities, the MoHUA, in their post evidence reply, stated as under:

> *"AMRUT scheme covers 500 selected cities with approximately 60% urban population (as per 2011 census) of the country. There are other 3,878 ULBs approximately, which are in dire need of similar programme. To extend coverage of similar scheme in the remaining ULBs, Jal Jeevan Mission (Urban) [JJM(U)] has been proposed with total outlay of ₹2,87,000 crore with the aim of providing universal coverage of water supply in urban areas by 2026. It is estimated that another 2.68 crore household tap connections need to be provided across all statutory towns, which will be catered through the proposed Mission."*

F. Impact of Climate change and Global warming on the availability of water resource including Ground water

2.39 Dwelling upon the issue of Climate Change impact on Ground water resource, Minstry of Environment, Forest & Climate Change, in their Background note, *inter alia*, stated as under:

> *"Global warming impacts hydrological cycle by directly increasing the evaporation of available Surface water and vegetation transpiration. These changes in turn can influence precipitation amounts, timings and intensity rates, and indirectly impact the flux and storage of water in surface and subsurface reservoirs (lakes, soil moisture, Ground water). In addition, there may be other associated impacts, such as seawater intrusion, water quality deterioration, potable water shortage, etc. The relationship between the changing climate variables and Ground water is complicated and poorly understood. The greater variability in rainfall could mean more frequent and prolonged periods of high or low Ground water levels. Saline intrusion in coastal aquifers may occur due to sea-level rise and resource reduction.*
>
> *However, all indications suggest the increased importance of handling water issues in a holistic and integrated fashion. Ground water should not be seen in isolation, especially in the context of climate change. It is the overall water balance and water audit within the impact of climate change that will be the key.*
>
> *The major challenges related to water resources in India in the context of climate change are the following:*
>
> - *Changing nature of the Indian summer monsoon under climate change, which can result in both devastating floods and frequent droughts;*
> - *Changing characteristics of the monsoon rainfall with more heavy rain events and less low-intensity rain events;*
> - *Rapid depletion of Ground water in many parts of India that is driven by excessive pumping and climate variability;*
> - *Increasing temperature has a negative impact on agriculture and food production;*
> - *Water demands are going to increase under warming climate while water availability during the dry season is likely to get reduced;*
> - *Climate change as well as the anthropogenic influence may further reduce water quality of surface and Ground water resource in India; and*
> - *Changes in Ground water quality in space and time in the event of temperature rise depends on the increase/ decrease in the rate of evapotranspiration and rainfall pattern. The increase in water temperature can enhance the solubility of water and consequently an increase in the concentration of inorganic constituents in water, which is likely to put a negative impact on human health. Similarly, in the event of extreme rainfall events, with an increase in runoff, the flushing of surface contaminants will reduce the pollutant load that ultimately seeps underground and joins Ground water, thus impacting Ground water quality."*

2.40 Further explaining the effect of climate change on Ground water, the representative of the DoWR, RD & GR, during the course of oral evidence held on 18.1.2021, stated as follows:

> *"We are looking at the effect of climate change on Ground water recharge due to difference in precipitation and transpiration. Because of temperature rise, the quantity of water going up has also increased and that has really reduced the water recharging at the ground level. It has affected the hydrological cycle of Ground water…"*

2.41 Asked to state whether any strategy has been formulated /remedial measures taken by the Ministry of Jal Shakti to address the issues arising out of climate change to manage water sector, the Committee were informed that the Government of India adopted National Action Plan on Climate Change (NAPCC) in June 2008 with 8 Missions. National Water Mission (NWM) is one of the Missions under NAPCC. The effect of climate change on water resources has been brought out in the Executive summary of draft Mission Document of NWM, which *inter alia* states as under:

> *"… Although the impact of climate change on water resources has not been accurately quantified, various studies indicate that the likely impact of climate change on water resources could contribute to further intensification of the extreme events. Further, the features of water resources – both the availability and the quality may also be considerably affected by the changes in the land use in the form of urbanization, industrialization and changes in the forest cover. Realizing that the various processes which influence the hydrologic cycle are of dynamic nature, precise quantification of the impact specifically due to climate change may not be a simple task and it would be necessary to make suitable assumption at the initial stages and undertake detailed simulation studies with more and more data as they become available with time. However, the likely impact of climate change on water resources could be in the form of:*
>
> *Decline in the glaciers and the snowfields in the Himalayas;*
>
> - *Increased drought like situations due to overall decrease in the number of rainy days in many parts of the country;*
> - *Increased flood events due to overall increase in the rainy-day intensity;*
> - *Effect on Ground water quality in alluvial aquifers due to increased flood and drought events;*
> - *Influence on Ground water recharge due to changes in precipitation and evapo- transpiration; and*
> - *Increased saline intrusion of coastal and island aquifers due to rising sea levels."*

2.42 On being asked whether any Inter-Ministerial Committee or institutional mechanism has been set up at the highest level for ensuring coordination amongst the concerned Ministries/Departments for taking concerted and focused action in relation to achieving goals enumerated under the NWM and also for prevention, control, regulation and management of Ground water, the Department, in their post evidence reply, stated as under:

> *"Following institutional mechanisms are available to ensure proper coordination among the concerned Ministries / Departments in order to achieve the goals enumerated in the Mission Document of the National Water Mission:*
>
> *i. ECCC has been constituted under the chairmanship of Principal Secretary to Hon'ble Prime Minister to look into the matters relating to climate change in which Ministry of Jal Shakti is a member. The Committee has been constituted by the MoEF&CC and address the issue of impact of climate change on water resources.*
>
> *ii. An AIPA has also been constituted under the chairpersonship of Secretary, MoEFCC for the purpose of ensuring a coordinated response on climate change matters and to monitor country's climate change obligations under the Paris agreement. Representatives of 14 concerned Ministries including Ministry of Jal Shakti are members of this Committee.*
>
> *iii. An Inter-ministerial Committee (IMC) on Water Conservation has been constituted under the chairmanship of Secretary, DoWR,RD&GR wherein representatives of 14 Ministries are members of this Committee. IMC has been constituted for overall coordination between Central and State Agencies and for convergence of all the schemes connected to water management.*
>
> *iv. A Technical Committee and a Steering committee have been constituted to review the progress of submission of reports for preparations of State Specific Action Plan (SSAP) by the States."*

2.43 The Committee note that setting up of National Water Mission(NWM) was originally approved way back in April, 2011 by the Government. However, as per Ministry's admission it took almost five years to get it established. Asked to state the reasons for inordinate delay in establishing NWM, DoWR, RD & GR, in their post evidence written submission, stated as under:

> *"NAPCC was approved by the Government of India and released by the Hon'ble Prime Minister of India on 30 June, 2008. NAPCC laid down the principles and identified the approaches to be adopted to meet the challenges of the impact of climate change through institutionalization of 8 national missions, one of which was the "National Water Mission". In December, 2008, Shri A.D. Mohile, Former Chairman, Central Water Commission was appointed as Consultant for drafting the Comprehensive Mission Document. A High Level Steering Committee (HLSC) of National*

Water Mission (NWM) was constituted under the Chairmanship of Secretary, M/o WR, RD &GR for preparing the Comprehensive Mission Document in 2011. Comprehensive Mission Document of National Water Mission was approved by Union Cabinet on the 6th of April, 2011. Accordingly a notification was issued in July 2011 setting up the National Water Mission. The other seven missions was also setup in the 2010 to 2014 period.

In the Cabinet Note, it was, inter-alia, envisaged that Mission Director will be delegated with necessary financial and administrative powers and the Mission Directorate would engage the services of consultants or outsourced the services of professionals on specific matters as and when required. The HLSC had their first meeting in March 2013 for deliberations on various aspects of the functioning of the mission- such as delegation of responsibilities and financial powers, constitution of various committees and determination of the scope of such committees.

In addition to above, the following also contributed to the delay:

i. Absence of full time Mission Director and delay in appointment of Advisers.

ii. Time taken in sanctioning of budget allocation: The process of formulation of the scheme for 'Implementation of National Water Mission' and their approval during the 12th Five Year Plan by the competent authority was a time consuming work. The scheme was sanctioned on 27th November, 2013 under which funds were allocated for setting up of National Water Mission Directorate.

iii. Inadequate availability of Consultants: An organization of technical nature for becoming fully functional requires the expertise of subject matter specialists. Therefore, the Cabinet Note provided engagement of services of consultants. Though one or two consultants had been posted in the National Water Mission from time to time, their numbers were not adequate.

iv. Lack of functional autonomy: Though National Water Mission is envisaged to work on a Mission Mode in order to achieve their goal within defined timelines which are a part of the Mission Document approved by the Cabinet, it is still functioning as apart of the ministry and no financial and administrative powers have still been delegated."

2.44 In their 10th Report (17 LS), the Committee had discussed the issue of inadequate funds and lack of functional autonomy to NWM and had recommended for adequate funding and more functional and financial autonomy to NWM in order to enable the Mission to discharge their functions effectively and achieve the goals set under the Mission.

2.45 When asked about the measures taken by the NWM to address the problem of serious depletion of Ground water resources, DoWR, RD & GR, in their post evidence written reply, stated as under:

"The following initiatives were undertaken by the NWM in the last two years:

(i) 'Catch the Rain' Campaign:

NWM, Ministry of Jal Shakti launched a campaign "Catch the Rain" with the tag line "Catch the rain, where it falls, when it falls" in February 2020 to nudge the States and all stakeholders to create RWHS suitable to the climatic conditions and sub-soil strata, with people's active participation, before the onset of monsoon to ensure storage of rainwater.

(ii) 'Sahi Fasal' Campaign:

NWM launched the "Sahi-Fasal" campaign in a workshop at Amritsar - one of Punjab's over-exploited districts- on 14th November 2019 to nudge the Indian agriculture to promote crops which use less water but more efficiently; have high nutritional quality and are economically remunerative to farmers, and based on a holistic and integrated strategy.

(iii) A monthly Water Talks series has been initiated from March, 2019 on third Friday of every month where leading water experts are invited to present inspiring and broadening perspectives on current water issues in the country.

(iv) A Water Tech Talk series has also been initiated in October, 2020 and has been conducted on 2nd Friday of every month to focus on technological and technical advancements pioneering research and academic excellence exhibited by experts in the water sector.

(v) Weekly dialogue series on "Catch the Rain" on every Saturday has also been started where Collectors/District Magistrates/Commissioners and water activists are invited to share their commendable work in their districts to address the water issues.

(vi) Other Projects: Apart from these, the projects viz. 'reparation of SSAP, Baseline Surveys, Industrial Water Use Efficiency, have also picked up pace during this period."

2.46 To a query as to whether any study has been conducted by the Department to understand the impact of climate change on availability of Ground water especially in the light of the fact that rainfall and seasonal patterns are undergoing rapid change with global warming, the Department, in a written note, submitted as under:

"Ground water is a major source of water across the globe, specifically for water supply in rural areas, in arid and semi-arid regions, however there has been paucity on research about the potential effect of climate on

groundwater. Aquifers are reliable source of water which can store water for decades to millennia. However, the sustainability of groundwater systems requires that groundwater withdrawals should match groundwater replenishment.

The heightened variability in climatic variables such as precipitation, temperature, and evapo-transpiration that is predicted under different climate change scenarios will have variable effects not only on different aquifers but also on different locations within an aquifer due to variations in spatial parameters such as hydraulic properties and distance from the recharge areas. It is quite clear that different aquifer systems are affected by hydrological processes to varying extent; e.g, Coastal and Island aquifers are impacted by sea level rise and resulting seawater encroachment, where as inland alluvial aquifers are impacted by varying frequency and severity of floods.

No authoritative Study to understand the impact of climate change on availability of ground water especially in the light of the fact that rainfall and seasonal patterns are undergoing rapid change with global warming has been carried out by either Central Water Commission or, Central Ground Water Board".

Chapter -III

Over exploitation of Ground water for irrigation needs in agriculture

3.1 The assessment of Ground Water extraction is carried out considering the Minor Irrigation Census data and sample surveys conducted by the State Ground Water Departments. The Total Annual Ground Water Extraction of the entire country for the year 2020 has been estimated as 244.92 BCM. Agriculture sector is the predominant consumer of Ground Water resources. About 89 % of total annual Ground Water extraction i.e. 217.61 BCM is for irrigation use.

3.2 The details of the State-wise Ground water extraction for irrigation are given in the following table:

State-wise Ground water extraction for irrigation, 2020

S. No.	States / Union Territories	Current Annual Ground water Extraction (in BCM)		Percentage Share of Ground water extraction for irrigation
		Irrigation	Total	
	States			
1	**Andhra Pradesh**	6.60	7.63	86.50
2	**Arunachal Pradesh**	0.003	0.01	30.00
3	**Assam**	1.97	2.58	76.36
4	**Bihar**	10.33	13.02	79.34
5	**Chhattisgarh**	4.53	5.35	84.67
6	**Delhi**	0.07	0.29	24.14
7	**Goa**	0.02	0.08	25.00
8	**Gujarat**	12.65	13.30	95.11
9	**Haryana**	10.47	11.61	90.18
10	**Himachal Pradesh**	0.20	0.36	55.56
11	**Jharkhand**	0.93	1.64	56.70
12	**Karnataka**	9.50	10.63	89.37
13	**Kerala**	1.16	2.65	43.77
14	**Madhya Pradesh**	17.33	18.97	91.35
15	**Maharashtra**	15.29	16.63	91.94
16	**Manipur**	0.003	0.02	15.00
17	**Meghalaya**	0.03	0.08	37.50
18	**Mizoram**	0.00	0.01	0.00
19	**Nagaland**	0.002	0.02	10.00
20	**Odisha**	5.50	6.86	80.17
21	**Punjab**	32.80	33.85	96.90
22	**Rajasthan**	14.37	16.63	86.41
23	**Sikkim**	0.00	0.01	0.00
24	**Tamil Nadu**	13.52	14.67	92.17
25	**Telangana**	7.13	8.01	89.01
26	**Tripura**	0.02	0.10	20.00
27	**Uttar Pradesh**	41.29	46.03	89.70
28	**Uttarakhand**	0.63	0.87	72.41
29	**West Bengal**	10.84	11.84	91.55

	Union Territories			
30	**Andaman & Nicobar**	0.0001	0.01	1.00
31	**Chandigarh**	0.01	0.05	20.00
32	**Dadra & Nagar Haveli**	0.01	0.03	33.33
	Daman & Diu	0.003	0.03	9.99
33	**Jammu & Kashmir**	0.20	0.89	22.47
34	**Ladakh**	0.001	0.02	5.00
35	**Lakshdweep**	0.00	0.003	0.00
36	**Puducherry**	0.10	0.15	66.66
	Grand Total	**217.61**	**244.92**	**88.85**

3.3 It is seen that in the States of Punjab, Haryana and Rajasthan, Ground water extraction for irrigation purpose as a percent of their total Ground water extraction (for all purposes) is 32.80 BCM out of 33.85 BCM (96.9 or 97%), 10.47 BCM out of 11.61 BCM (90%) and 14.37 BCM out of 16.63 BCM (86%) respectively. Excessive withdrawal of Ground water is also seen in other States such as Gujarat, where it is 12.65 BCM out of 13.30 i.e. 95%, Karnataka, where it is 9.50 BCM out of 10.63 BCM i.e. 89%, Tamil Nadu, where it is 13.52 BCM out of 14.67 BCM i.e. 92%, and Uttar Pradesh, where it is 41.29 BCM out of 46.03 BCM i.e. 89.7 or 90%.

3.4 The Committee were informed that CGWA has been formulating Guidelines for regulating Ground water development for industries/infrastructure/ mining projects in the country. As such CGWA is not regulating Ground water for irrigation purposes. When queried whether similar Guidelines by CGWA in regard to extraction of Ground water for irrigation purposes is an imperative need, as 89% of total Ground water draft is used in irrigation, the DoWR, RD & GR, in their written submission, stated as under:

> *"As per Minor Irrigation Census 2013-14, 87.86% of wells are owned by marginal, small and semi-medium farmers having land holding up to 4 hectares (ha). Around 9.18 % of wells are owned by medium farmers having land holding 4 – 10 ha and 2.96% of the wells are owned by big farmers having land holding more than 10 ha. Thus, it can be considered that majority of the wells in India are being operated by poor farmers who depend on the production of food grains etc. for their livelihood. Further, considering the huge number of Ground water abstraction structures (around 20.46 million structures), regulation of Ground water in agriculture sector through a "command and control" strategy will prove to be an arduous task. Therefore, a participatory approach for sustainable Ground water management would be more productive.*
>
> *In the CGWA Guidelines, States/UTs have been advised to review their free/subsidized electricity policy to farmers, bring suitable water pricing policy and work further towards crop rotation/ diversification/ other initiatives to reduce over-dependence on Ground water*."

3.5 On being asked about the rationale/reasons behind non- regulation of Ground water use for irrigation purpose, the Department stated as under:

> *"It is true that non-regulation of Ground water for irrigation would have impact on depletion of Ground water in certain pockets of the country. In order to take necessary measures, concerned State Departments (Agriculture/ Irrigation/ Water Resources) need to undertake suitable demand and supply side measures to ensure sustainability of Ground water sources. Further, States/UTs need to review their free/subsidized electricity policy to farmers, bring suitable water pricing policy and work further towards crop rotation/diversification/other initiatives to reduce overdependence on Groundwater. A number of States have already started working in this direction keeping the grim Ground water situation. Mention can be made for the initiatives taken by Punjab and Haryana, who have started 'Pani Bachao Paisa Kamao' and 'Jal Hi Jeevan/Mera Pani Meri Virasat' etc respectively to motivate farmers towards water conservation."*

3.6 As per Indian Council for Agricultural Research (ICAR), the major water intensive crops grown in India are Rice and Sugarcane. West Bengal, Uttar Pradesh, Punjab, Odisha and Andhra Pradesh are major rice growing States of India. Further, Uttar Pradesh, Maharashtra and Karnataka are major sugarcane producing States in India. The total water requirement of rice in India is on an average 1000-1200 mm, whereas water requirement of sugarcane on an average is 1800-2400 mm. However, comparing with other major crop producers in the world, the water requirement in India is higher due to varying agro-climatic and edaphic factors (soil properties), crop duration and method of water application.

3.7 When asked about the total amount of water consumed for production of one kilogram of rice and sugarcane in India *vis a vis* other major producers of these crops in the world, the Department of Agriculture and Farmer's Welfare (DA & FW), in their post evidence reply, stated as under:

> *"As per ICAR, the water requirement of rice and sugarcane varies widely in different countries including India depending upon the climate, soil condition, crop duration, method of water application and management practices, etc. The water requirement of rice in India ranges from 1000 mm to 1200 mm, and for sugarcane it ranges from 1800 mm to 2400 mm.*
>
> *The major producers of rice crop are Asian nations i.e. China, India, Indonesia, Bangladesh and Vietnam. As per FAO publication, the total water requirement of rice in Asia under different ecologies is estimated on an average as 550-950 mm. It significantly varies from 550 mm in rainfed uplands to 1000 mm in rainfed lowlands / irrigated uplands, and to 1650 mm in irrigated lowlands/ deep water ecosystems. The major producers of sugarcane crop are Brazil, India, China and Thailand. The water requirement of sugarcane in Brazil is reported to range from 1059 to 1640 mm."*

3.8 On being asked about the steps, if any, taken by the DA & FW to reduce the water drawal/intake by agriculture sector from Ground water resources, the Department, in their post evidence reply, stated as under:

"Under the umbrella of PMKSY, DA&FW is implementing PMKSY-Per Drop More Crop (PDMC) since 2015-16. The PMKSY- PDMC focuses on enhancing water use efficiency at farm level through Micro Irrigation viz. Drip and Sprinkler Irrigation System. Besides promoting micro Irrigation, this component also supports micro level water storage or water conservation/management activities to supplement source creation for Micro Irrigation. In addition to the above, a dedicated Micro Irrigation Fund (MIF) has been created with National Bank for Agriculture and Rural Development (NABARD) with objective to facilitate States in mobilizing resources for expanding coverage of Micro Irrigation…

Mission for Integrated Development of Horticulture (MIDH) is being implemented since 2014-15 for holistic growth of horticulture sector covering fruits, vegetables, root and tuber crops, mushrooms, spices, etc. in all parts of country. Under the scheme, assistance is provided for creation of water sources for promotion of rainwater conservation through constructions of community tanks and Water Harvesting Structures (WHS). During last three years, 8804 nos. of community tanks and 10793 WHS has been constructed under MIDH. Besides, under MIDH, assistance is provided for area expansion of fruit crops with integrated package including drip irrigation.

Cultivation of pulses and coarse cereals under National Food Security Mission (NFSM) and oilseeds under National Mission on Oilseeds and oil Palm (NMOOP) in the country are being promoted as these crops require less water.

For increasing the productivity and production, latest crop production and protection techniques like System of Rice Intensification (SRI), Direct Seeded Rice (DSR), line Transplanting, stress/drought tolerant/ climate resilient varieties, bio-fortified varieties, Integrated Nutrient Management (INM), Integrated Pest Management (IPM) techniques are promoted. Further, to effectively and efficiently use water and maximize rice yields, the assistance is also being provided for improved farm implements &water saving devices i.e., water carrying pipes, sprinkler sets, pumpsets and mobile raingun for judicious use of water for cultivation of rice crop and also create awareness among the farmers through training programmes.

Crop Diversification Programme (CDP) is being implemented in original Green Revolution States of Punjab, Haryana and Western Uttar Pradesh to diversify cropping pattern away from water guzzling paddy. Water conservation techniques like Direct Seeded Rice (DSR), System of Rice Intensification (SRI), alternate wetting & drying method, laser land levelling, adoption of short duration varieties, etc are promoted through NFSM & BGREI. Under Crop Diversification Programme, 5,01,257 ha. area is covered during 2013-14-2019-20 whereas under DSR and SRI, an area of 1,33,458 ha. and 1,26,285 ha. has been covered under NFSM & BGREI during 2017-18 to 2019-20 respectively.

National Mission on Oilseeds and Oil Palm (NMOOP) launched during 2014-15 envisages increasing production and productivity of oilseeds crops and oil palm

through bringing in fallow areas under oilseed crops and diversification of area from low yielding cereals. It aims to achieve the required target by addressing major constraints to crop productivity through promotion of relevant technological interventions. NMOOP has been merged with NFSM as NFSM (Oilseed & Oil palm) from 2018-19. Various interventions such as providing Seeds, trainings, production inputs and implements for oilseeds production are provided under NMOOP.

ICAR suggests judicious use of water through efficient irrigation techniques including micro-irrigation for various crops to save irrigation water substantially. It may be noted that the water use efficiency of micro irrigation including drip irrigation is as high as 80-95% in comparison to only 30-50% in conventional flood irrigation. For sustainable management of water resources, ICAR suggest Ground water recharge, conjunctive use of Surface water, Ground water and rainwater.

As per the latest notified Guidelines of CGWA, no target has been fixed in irrigation sector. However, all industries abstracting Ground water in excess of 100 cum/d are required to undertake annual water audit. All such industries are required to reduce their Ground water use by at least 20% over the next three years."

A. Water use efficiency in agriculture - PMKSY- Per Drop More Crop (PDMC) through Micro Irrigation

3.9 The Committee have been informed by the DA&FW that PMKSY- PDMC scheme mainly focuses on enhancing water use efficiency at farm level through micro irrigation viz. Drip and Sprinkler Irrigation. Besides promoting Micro Irrigation, the scheme also supports micro level water storage or water conservation/management activities as Other Interventions (OI) to supplement Micro Irrigation. The OI activities may be taken up based on actual requirement. Further the OI activities are to be linked with Micro Irrigation to make potential use of the available funds for higher water use efficiency. The physical targets achieved under the scheme during the last five years is as under:

Year	**Coverage of Micro Irrigation** (Lakh Ha)		**Protective irrigation potential creation through micro level water harvesting/ storage activities (ha)**	
	Target	Achievement	Target	Achievement
2015-16	5.0	5.73	45000	21555
2016-17	8.0	8.4	70000	72683
2017-18	12.0	10.49	80000	102516
2018-19	16.0	11.58	100000	130281
2019-20	14.0	11.72	90000	99100
Total	**55.0**	**47.92**	**385000**	**426135**

The State wise details of percentage of micro irrigation area covered during last 5 years under PDMC against the agricultural land

Area in Ha

S No.	State	Micro Irrigation Area	% agricultural land

		covered during 2015-16 to 2019-20	covered under micro irrigation during 2015-16 to 2019-20
1	Andhra Pradesh	743992	8.25
2	Arunachal Pradesh	-	-
3	Assam	11725	0.35
4	Bihar	17417	0.26
5	Chhattisgarh	86987	1.56
6	Goa	736	0.37
7	Gujarat	700190	5.53
8	Haryana	52690	1.39
9	Himachal Pradesh	8435	1.03
10	Jammu & Kashmir	70	0.01
11	Jharkhand	21849	0.51
12	Karnataka	925176	7.23
13	Kerala	2777	0.12
14	Madhya Pradesh	219100	1.27
15	Maharashtra	605299	2.87
16	Manipur	4154	0.94
17	Meghalaya	-	-
18	Mizoram	2746	0.75
19	Nagaland	2830	0.41
20	Orissa	29133	0.44
21	Punjab	5798	0.14
22	Rajasthan	264756	1.04
23	Sikkim	3297	3.40
24	Tamil Nadu	618700	7.63
25	Telangana	236247	3.44
26	Tripura	-	-
27	Uttarakhand	17148.41	1.11
28	Uttar Pradesh	174383	0.92
29	West Bengal	37331	0.66

3.10 When asked whether any financial assistance is being given to States experiencing severe Ground water depletion so as to encourage them to adopt micro irrigation, the DA & FW, in their post evidence reply stated as follows:

"...PMKSY adopts State level planning and projectised execution that allows States to draw up their own irrigation development based on District Irrigation Plans and State Irrigation Plans. Central Assistance under the scheme is released to States based on their Annual Action Plan (AAP) approved by the State Level Sanctioning Committee (SLSC) headed by the Chief Secretary of the State. The SLSC is empowered to identify the programme interventions and operational area in the State. Micro-Irrigation scheme is demand driven scheme wherein States prepare AAP as per their priority and requirement. Accordingly, tentative allocation is made to States based on their AAP and past performance. However, if a State performs better and demands more funds, that are made available to the particular State on basis of availability. States which are lagging behind in programme implementation are given handholding support from Govt. of India by resolving the issues after discussions in periodical review meetings and taking up matters with higher officials in State Govt. Further, a corpus of Micro-Irrigation Fund (MIF) is

formulated in NABARD for facilitating States in mobilising resources for micro-irrigation expansion in the States..."

3.11 On being asked about the rationale for having funding pattern of 90:10 for micro irrigation in respect of North East States where Ground water resource is abundant and the reasons for disparity in allocation of funds to States under the PMKSY- Per Drop More Crop scheme, the DA & FW, in their written reply, stated as under:

"PDMC scheme is a Centrally Sponsored Scheme (CSS). As per the Ministry of Finance regulation for CSS, the funding pattern of core schemes is 60:40 between the Centre and the States, 90:10 for North Eastern and Himalayan States and 100% funding for UTs. Besides, Ministry of Finance has further directed to allocate 10% of the Central plan for the North Eastern region and Sikkim under relevant functional heads.

North Eastern region has high rainfall, but due to topographical and socio-economic conditions, the farmers are not able to utilise fully, the potential of the rain fall and Ground water resource. However, the Implementation of the PMKSY- Per Drop More Crop would be helpful to the farmers of North Eastern States for enhancing the water use efficiency at farm level to enhance the production & productivity of the crops and increase the income of the farmers. Besides, it is stated that, allocation is made on principle of inclusivity and the allocation made to North-Eastern States is not starving the other States of funds. Since, the Micro-Irrigation scheme is demand driven scheme wherein States prepare AAP as per their priority and requirements, accordingly, tentative allocation is made to States based on their AAP and past performance. The Central Assistance is released based on the Annual Action Plans approved by the State Level Sanctioning Committee (SLSC) headed by Chief Secretary. However, if a State performs better and demands more funds, that are made available to the particular State, on basis of availability."

3.12 The details of fund released under Per Drop More Crop Component of PMKSY during 2015-16 to 2019-20 is as under:

Rs in Crore

S.No.	States/UT	2015-16	2016-17	2017-18	2018-19	2019-20	Total
1	Andhra Pradesh	206.47	308.69	517.10	520.00	452.00	2004.26
2	Bihar	28.60	21.60	12.50	27.91	0.00	90.61
3	Chhattisgarh	20.30	44.80	55.00	43.39	32.15	195.64
4	Goa	0.30	0.80	0.00	1.20	0.50	2.80
5	Gujarat	213.05	274.00	300.00	272.50	280.00	1339.55
6	Haryana	34.97	27.00	14.01	27.41	16.80	120.19
7	Himachal Pradesh	7.60	8.50	19.25	26.00	18.00	79.35
8	Jharkhand	14.97	30.70	25.00	10.00	22.97	103.64
9	Jammu & Kashmir	4.87	5.40	3.00	7.80	27.00	48.07
10	Karnataka	213.12	229.00	385.00	372.03	410.00	1609.15
11	Kerala	8.53	0.00	25.00	4.00	0.00	37.53

12	Madhya Pradesh	161.74	121.10	150.00	132.56	102.00	667.40
13	Maharashtra	107.26	305.70	362.50	360.00	325.00	1460.46
14	Odisha	28.70	39.70	48.00	58.00	30.00	204.40
15	Punjab	43.00	1.18	0.00	9.00	0.00	53.18
16	Rajasthan	142.84	129.00	107.50	168.48	75.00	622.82
17	Tamil Nadu	129.78	143.50	369.55	355.00	523.00	1520.83
18	Telangana	111.32	189.00	257.00	122.00	0.00	679.32
19	Uttarakhand	9.60	15.00	27.20	43.00	32.00	126.80
20	Uttar Pradesh	37.51	41.40	55.00	87.88	100.00	321.79
21	West Bengal	4.80	19.90	31.00	40.00	20.00	115.70
22	Arunachal Pradesh	2.60	2.00	8.30	12.50	18.00	43.40
23	Assam	5.03	11.00	3.00	30.00	42.00	91.03
24	Manipur	2.76	3.60	7.50	40.00	40.00	93.86
25	Meghalaya	1.43	0.00	3.30	12.00	0.00	16.73
26	Mizoram	3.27	8.10	12.30	27.80	28.00	79.47
27	Nagaland	2.34	4.50	11.80	35.00	53.00	106.64
28	Sikkim	4.86	5.40	4.00	55.19	31.79	101.24
29	Tripura	1.55	0.00	3.75	15.00	18.00	38.30
30	Andman& Nicobar Island	0.20	0.00	0.50	0.00	0.00	0.70
31	Puducherry	2.03	0.00	0.00	0.00	0.00	2.03
32	Ladakh					2.40	2.40
33	HQ	1.33	0.67	1.43	2.73	0.40	6.56
	Grand Total	**1556.73**	**1991.24**	**2819.49**	**2918.38**	**2700.01**	**11985.85**

3.13 During the course of oral evidence held on 28 December, 2020, when a query was raised as to why lesser funds were allocated for micro irrigation to States which are suffering from acute Ground water crisis, the representative of the DA&FW, deposed following before the Committee:

> *"Sir, there are some States such as Punjab, West Bengal, Kerala and some States in North East who are not demanding funds for micro irrigation. We have made allocation, but they do not demand for budget. This is the record for last five years. We have asked for their AAP. These States have previous unspent balances."*

3.14 When the Committee pointed out that since States in the North East and Eastern parts of the country have high water table (Water is available within 10 feet), there is no need for them to practice Micro irrigation with a higher Central financial assistance, the representative of DoWR, RD & GR stated as under:

> *"Funding pattern of 90:10 in North Eastern States for micro irrigation has not much implication because they are not demanding the allocation. Even if we have allocated funds, it does not mean that other States are starved and funds are not being released. There are two- three issues in this besides water scarcity. There are some States such as Andhra Pradesh, which have dedicated directorate structure for micro irrigation at each district and block*

levels. Further in some States subsidy is given to companies. In others it is given directly to farmers and therefore companies are reluctant in such areas. In some States despite having better structure facilitating micro irrigation, lack of awareness (such as possibility of paddy cultivation with micro irrigation) about application of micro irrigation practices, has led to lesser use of these methods".

3.15 When asked about the problems/difficulties faced by farmers in adoption of micro irrigation methods for crop cultivation and remedial measures taken to address these problems as well as incentives to farmers, the DA & FW, stated following in their post evidence reply:

"Problems faced by farmers in adoption of MI are as follows:

- *It is observed that the farmer's, especially small and marginal farmers face difficulty due to high initial investment for establishment of Micro Irrigation system. As such, to address this issue, under the PDMC scheme, financial assistance is available @ 55% for small and marginal farmers and @ 45% for other farmers for installation of Drip and Sprinkler Irrigation systems. Further, 25% higher unit cost have been taken into calculation of subsidy for the North Eastern and Himalayan States and 15% higher for States with low penetration of Micro Irrigation for larger adoption of systems by the farmers under the scheme. In addition, some States provide additional incentives / top up subsidy for encouraging farmers to adopt Micro Irrigation. The Government of India has also set up a dedicated Micro Irrigation Fund (MIF) with NABARD with objective to facilitate the States in mobilising the resources for expanding coverage of Micro Irrigation.*
- *Some farmers lack water storage, pumps, pipes, etc. for installing micro-irrigation. Therefore, to facilitate installment of Micro Irrigation, the scheme also supports micro level water storage or water conservation/management activities to facilitate farmers for Micro Irrigation.*
- *Often the target beneficiaries are not aware of the benefits and incentives of the Micro-irrigation system. To facilitate awareness of benefit and applications of MI system among farmers, the scheme has provisions for organizing wide publicity campaigns through press, print and digital media, publication of leaflets/booklets, organization of workshops, exhibitions, farmer fairs, information on State/Government of India web portals etc. In addition, Indian Council of Agricultural Research (ICAR) imparts training and organizes field demonstrations through Krishi Vigyan Kendras (KVKs) to educate farmers for promotion of efficient irrigation techniques / Micro Irrigation for various crops.*
- *Some beneficiaries also face difficulty in quality and after sales service of equipment. As per PMKSY-PDMC Guidelines only BIS marked systems/components can be supplied under the scheme. Besides, the equipment providing company has to provide free after sales service to the beneficiary for a period of at least three years from the date of installation of the system. If it fails to provide free*

after sales service, action as appropriate similar to other consumer products may be initiated. In case of violations, penalty provisions have been specified in the Guidelines. Repeated failures will lead to de-registration of the company with approval of SLSC."

3.16 Asked to state the existing mechanism put in place to ensure that good quality micro irrigation system / tools are available to farmers with adequate product guarantee so as to reduce recurrent expenditure on repairs and maintenance, the DA&FW, in their post evidence written reply, stated as under:

"As per the Operational Guidelines of the scheme, quality components having BIS marking to be installed in the farmer's field, and while making payment the State implementing agency need to ensure the BIS standard of supplied equipment. The installed system has to match the water requirement of the crop.

Necessary orientation and training is to be given to the beneficiary on the system maintenance & irrigating the crop with drip/sprinkler irrigation by Supplier Company and the State officials. Proper warranty and a user's manual for running & maintenance of the system to be provided to the beneficiary.

A certificate towards successful installation/commissioning of the system has to be obtained from the beneficiary for release of subsidy. Registration of micro irrigation system manufacturer's is done for a period of five years with the approval of SLSC. Only those manufacturing companies, which have all the facilities to ensure supply of quality product as per BIS standards and can provide prompt after sales services are registered. If the company fails to provide free after sales service, action as appropriate similar to other consumer products is initiated against it. In case of violations, penalty provisions have been specified in the Guidelines. Repeated failures will lead to de-registration of the company with approval of SLSC."

3.17 Further asked about the current level of GST imposed on micro irrigation equipments and whether reduction in GST on equipments will ensure reduction in their prices and encourage wider use of micro irrigation, the DA&FW, in their post evidence reply, stated as under:

"At the time of implementation of GST, the GST rate on Micro Irrigation Systems viz. Drip and Sprinkler system was applicable as 18%. In view of the importance of Drip and Sprinkler systems in Agriculture, this Department had requested Department of Revenue, Ministry of Finance to keep GST slab at the minimum. With the result of constant request, the GST rate was reduced to 12%. Accordingly, present GST rate on these systems is 12%..."

B. Free/subsidised electricity to Agricultural Booster Pumps

3.18 Electrical motor pumps are usually used to pump out the water from the borewells. The Government is now giving subsidy for solar pumps also. This convenience of motor pumps has led to increase in the depletion of the Ground

water at a faster pace. Further as per the provisions of Electricity Act 2003, respective State Electricity Regulatory Commissions (SERCs) determine the electricity tariff for retail supply of electricity to end consumers including Agricultural consumers. Section 65 of the Electricity Act, 2003 provides that State Government can provide subsidy to any class of consumers in the tariff determined by the SERCs. Hence Central Government has no role in providing electricity subsidy to the farmers for their agricultural purposes.

3.19 In response to a query on effect of free/subsidised power supply to agriculturalists, in causing depletion of Ground water levels in the country, the DoWR, RD & GR, in their written reply, stated as under:

> *"World Bank Report on Deep well and Prudence: Towards Pragmatic Action for Addressing Ground water Overexploitation in India, 2010, mentioned that electricity subsidies are widely (and correctly) perceived to be one of the main causes of Ground water overexploitation."*

3.20 When asked whether any proposal is being considered to restrict free supply of electricity for agriculture or limiting the supply to a specific time period in a day to avoid misuse of Ground water, the DoWR, RD & GR, in their post evidence reply, stated as under:

> *"It is true that restriction of free electricity to the farmers can reduce the misuse of Ground water. The subsidized electricity provided by State Governments has led to the over-extraction as farmers use it extensively to run pumps that draw up Ground water. States like Punjab, Haryana, Telangana and Tamil Nadu offer completely free power, while other States have provision for collection of token charges. In order to have sustainable Ground water management, policies starting with abolishing or restricting subsidised electricity is imperative. Improving irrigation efficiency by using other types of irrigation using latest technologies, can save substantial amount of Ground water and reduce the pressure on the Ground water systems."*

3.21 Further queried about any steps taken by the Government to persuade States to bring alternatives schemes to curb rampant use of subsidized/free electricity in agriculture, DoWR, RD & GR, in their post evidence reply, stated as under:

> *"As per the information received from Ministry of Power, Electricity is a concurrent subject. Supply and distribution of electricity at affordable rate to all the consumers including farmers in a State / UT falls within the purview of the respective State Government / State Power Utility. As per provisions of Electricity Act 2003, respective State Electricity Regulatory Commissions*

(SERCs) determine the electricity tariff for retail supply of electricity to end consumers."

3.22 When asked to state the steps taken by the DA&FW to impress upon States the need to restrict free supply of power, the Department, in their post evidence reply, stated as under:

"The Government of India supplements the efforts of the State Governments through various measures for improvement in power sector and to provide electricity at affordable rates. The State Government can give subsidy to the extent they consider appropriate as per provision of Section 65 of the Electricity Act, 2003.
The provisions regarding subsidy under the Section 65 of Electricity Act, 2003 and the provisions in the Para-8.3 of Tariff Policy 2016 in respect of determination of tariff after taking in to account the Ground water level conditions are reproduced as under:

Section 65. Provision of subsidy by State Government (As per Electricity Act, 2003):
If the State Government requires the grant of any subsidy to any consumer or class of consumers in the tariff determined by the State Commission under Section 62, the State Government shall, notwithstanding any direction which may be given under Section 108, pay, in advance in the manner as may be specified, by the State Commission the amount to compensate the person affected by the grant of subsidy in the manner the State Commission may direct, as a condition for the licence or any other person concerned to implement the subsidy provided for by the State Government:
Provided that no such direction of the State Government shall be operative if the payment is not made in accordance with the provisions contained in this Section and the tariff fixed by State Commission shall be applicable from the date of issue of orders by the Commission in this regard.

8.3 Tariff design: Linkage of tariffs to cost of service (As per Tariff policy, 2016):
It has been widely recognized that rational and economic pricing of electricity can be one of the major tools for energy conservation and sustainable use of Ground water resources. In terms of the Section 61(g) of the Act, the Appropriate Commission shall be guided by the objective that the tariff progressively reflects the efficient and prudent cost of supply of electricity.
The State Governments can give subsidy to the extent they consider appropriate as per the provisions of Section 65 of the Act. Direct subsidy is a better way to support the poorer categories of consumers than the mechanism of cross-subsidizing the tariff across the board. Subsidies should be targeted effectively and in transparent manner. As a substitute of cross subsidies, the State Government has the option of raising resources through mechanism of electricity duty and giving direct subsidies to only needy consumers. This is a better way of targeting subsidies effectively.
Accordingly, the following principles would be adopted:
1. Consumers below poverty line who consume below a specified level, as prescribed in the National Electricity Policy may receive a special support

through cross subsidy. Tariffs for such designated group of consumers will be at least 50% of the average cost of supply.
2. For achieving the objective that the tariff progressively reflects the cost of supply of electricity, the Appropriate Commission would notify a roadmap such that tariffs are brought within ±20% of the average cost of supply. The road map would also have intermediate milestones, based on the approach of a gradual reduction in cross subsidy.
3. While fixing tariff for agricultural use, the imperatives of the need of using Ground water resources in a sustainable manner would also need to be kept in mind in addition to the average cost of supply. Tariff for agricultural use may be set at different levels for different parts of a State depending on the condition of the Ground water table to prevent excessive depletion of Ground water. Section 62 (3) of the Act provides that geographical position of any area could be one of the criteria for tariff differentiation. A higher level of subsidy could be considered to support poorer farmers of the region where adverse Ground water table condition requires larger quantity of electricity for irrigation purposes subject to suitable restrictions to ensure maintenance of Ground water levels and sustainable Ground water usage".

3.23 Further asked about any measures/ways devised by the Ministry of Jal Shakti in consultation with the Ministry of agriculture & Farmers' Welfare and the Ministry of Power to reduce electricity consumption in agriculture, the DoWR, RD & GR stated following in their post evidence reply:

"The point is noted for taking up the matter with Ministry of Agriculture & Farmers' Welfare and Ministry of Power. However, the States/UTs have been advised from time to time in this regard."

3.24 During the course of oral evidence held on 28.12.2020, a representative of the Ministry of Power informed following about the initiatives taken by the State Governments to reduce power consumption:

"In Punjab, State Government is refunding the money to farmers. They are incentivized saying that if you decrease the consumption of electricity, then you can retain your money as well. If a farmer has paid Rs.100, but used electricity worth only Rs.50, he can keep the balance Rs. 50 with him. There is an incentive to consume less water and at the same time, they can earn money as well. Similar scheme has been launched in Andhra Pradesh as well. In Jharkhand, I was told that they are also trying to bring some scheme like this. As far as Central Government is concerned, we do not have much role as States decide about subsidy."

3.25 Asked to furnish a note on alternative measures such as use of pre-paid cards, restricting the power supply for a few hours in the day, etc. to prevent over extraction of Ground water, the DoWR, RD & GR stated following in their post evidence reply:

"Reply for this is awaited from Ministry of Power, however, as per information gathered from the website of Ministry of Power they are implementing Deendayal Upadhyay Gram Jyoti Yojana which has a component of separation of agriculture and non-agriculture feeders facilitating judicious rostering of supply to agriculture & non-agriculture consumers in rural areas."

C. Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM)

3.26 Government has approved Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM) Scheme with an objective of increasing farmers' income, provide reliable source for irrigation and de-dieselise the farm sector. The expansion of Scheme was announced in the Budget for 2020-21, which was approved by Ministry of Finance. The Scheme consists of three components:

- **Component-A:** 10,000 MW of Decentralized Ground Mounted Grid Connected Renewable Power Plants.
- **Component-B:** Installation of 20 lakh standalone Solar Powered Agriculture Pumps.
- **Component-C:** Solarisation of 15 Lakh Grid-connected Solar Powered Agriculture Pumps.

3.27 All three components combined, the scheme aims to add a solar capacity of 30.8 GW by 2022. The total Central financial support provided under the scheme would be Rs. 34,035 crore including service charges of 2% on eligible CFA to implementing agencies.

3.28 During the oral evidence held on 28.12.2020, the representative of the DA & FW informed following about the PMKUSUM scheme:

"Sir for solar pumps, PMKUSUM scheme has been launched. Micro irrigation has been tied up with this scheme. Micro irrigation is mandatory in areas where solar pumps are being provided. Otherwise, again it might lead to excess withdrawal of the Ground water. We are working with MNRE in this regard. In fact, PM-KUSUM has also become an eligible activity under Agri-Infrastructure Fund."

3.29 Asked to clarify the linking of provision of solar pumps under PMKUSUM to mandatory installation of micro irrigation system, the DA & FW, in their post evidence reply, stated as under:

"The Note provided by M/o New & Renewable Energy has mentioned that, in regard to the water conservation practices followed in PM-KUSUM, in order to minimize the water usage for irrigation purpose, preference will be given to the farmers using Micro irrigation systems or covered under Micro irrigation schemes or who opt for micro irrigation system. The size of pump would be selected on the basis of water table in the area, land covered and quantity of water required for irrigation. Therefore, although availability of micro-irrigation system is not a mandatory condition for installation/ solarization of pumps, farmers installing such systems will be prioritized while extending benefits of the Scheme.

Further, new solar pumps would not be covered under the Scheme in Dark zones/black zones. However, existing standalone diesel pumps can be converted into standalone solar pumps in these areas provided they use micro irrigation techniques to save water. This provision which is a necessary condition for solarization of pump in such areas would help in reducing water consumption and would also induce behavioural changes in farmers in such areas to move towards less water intensive crops."

D. Cultivation of water intensive crops - Role of Procurement of crops at Minimum Support Price

3.30 NABARD in their report 'Water Productivity Mapping of Major Indian Crops', 2018 mentions that the water guzzler paddy and sugarcane crop using more than 60 per cent of irrigation water available in the country are largely being cultivated in the most water scarce regions of the country restricting irrigation water availability for other major crops of the region. This situation has emerged over years primarily due to skewed incentive structures for rice and sugarcane in these regions. These incentives manifest in highly subsidized pricing of water, power, fertilizers on one hand and assured markets for their outputs through procurement of rice in Punjab-Haryana belt and of sugarcane by sugar factories at Government determined prices.

3.31 When asked as to what policy measures are being contemplated/formulated to incentivize farmers to grow crops suitable to the existing geographical conditions, the DA&FW, in their post evidence reply, stated as under:

"The Government announces MSPs for 22 mandated agriculture crops and FRP for sugarcane on the basis of recommendations of CACP. The MSPs for coarse cereals, pulses and edible oils have been fixed at a higher level to incentivize farmers to grow more pulses, coarse cereals and edible oil…

In order to reduce the water consumption during production of sugarcane, Department of Food and Public Distribution encourages the sugar mills by providing loans at very subsidized rates from the Sugar Development Fund under Sugarcane Development Scheme for adopting drip irrigation system."

3.32 In response to a query on role of State Governments in encouraging production of less water intensive crops and bringing about changes in crop production pattern/crop diversification in their States, the DA&FW, stated following in their post evidence reply:

> *"The Ministry of Agriculture & Farmers Welfare is implementing Centrally Sponsored Schemes through State's Department of Agriculture besides technical back stopping through Indian Council of Agricultural Research (ICAR) & State Agriculture Universities. Under Centrally Sponsored Scheme, the State provides matching share of expenditure as an investment in Agriculture sector to address the problems and support innovations...*
>
> *In order to encourage production of less water intensive crops, the incentives are given to the farmers for growing less water requiring crops like pulses, oilseed, millets and cotton under National Food Security Mission (NFSM). Further, to enhance the water use efficiency, the assistance is being provided for water saving devices like sprinkler sets, rain gun, drip irrigation water carrying pipes etc under NFSM and Pradhan Mantri Krishi Sinchayee Yojana (PMKSY). To encourage judicious use of water in paddy cultivation, water conservation techniques like Direct Seeded Rice (DSR) and System of Rice Intensification (SRI) are being promoted under NFSM through State Department of Agriculture. The States also promote drip irrigation systems in water intensive crops like sugarcane under PMKSY and RKVY.*
>
> *Crop Diversification Programme (CDP) was launched in 2013-14 as a sub scheme of Rashtriya Krishi Vikas Yojana (RKVY) for Punjab, Haryana and Western Uttar Pradesh. The focus of the programme is to demonstrate the prospectus, potential and performance of alternative crops to replace paddy in select districts of these states. Wheat replacement is not covered under CDP. The Government of India has allocated an amount of Rs 110 Crores for Crop Diversification Programme (CDP) during 2020-21."*

3.33 A query was raised as to what extent crop diversification has been successful in Green Revolution States of Punjab, Haryana and Western Uttar Pradesh in weaning away farmers from cultivation of paddy and wheat. Replying to this, DA&FW, stated following in their post evidence reply:

> *"…As per report of the States, alternative crops demonstrations, in place of paddy crop, have been conducted in an area of 5,01,257 hectare during the period from 2013-14 to 2019-20 for encouraging farmers to adopt alternative crops under CDP. The programme has helped in creating awareness among the paddy growing farmers. However, the rice-wheat system prevails and dominates in these States due to stable and assured procurement of rice & wheat and subsidized / free electricity & water. Realizing the need of crop diversification, the State of Haryana has launched a State scheme "Mera Pani Meri Virasat". Punjab and Uttar Pradesh have also implemented CDP and advocacy for creating awareness to replace paddy."*

Chapter IV

Ground Water use by industries

4.1 With a view to facilitate sustainable development of Ground water, CGWA has been granting NOCs with mandatory conditions and directions for Ground water withdrawal by industries, infrastructure projects and mining projects since 1999 in States/UTs which either do not have functional Ground water Authorities or do not regulate Ground water development through Government orders. The States and UTs where CGWA is not regulating Ground water are Andhra Pradesh (except for mining), Chandigarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Puducherry, Punjab, Telangana (Except for mining), Tamil Nadu, Uttar Pradesh, West Bengal and Lakshadweep. Further, Ministry has notified Guidelines *vide* Gazette Notification dated 24 September 2020 for regulation and control of Ground water extraction in India with pan-India applicability. The Guidelines are likely to promote sustainable withdrawal.

4.2 Salient features of Guidelines are as under:

(i) These Guidelines will have pan India applicability. Ground water abstraction in States/ UTs (which are not regulating Ground water abstraction) shall continue to be regulated by Central Ground Water Authority.

(ii) Guidelines primarily seek to regulate Ground water extraction for commercial usage. The Guidelines have been prepared with an aim to streamline the existing procedure and make it more transparent.

(iii) Individual domestic consumers (in both rural and urban areas) for drinking water and domestic uses, Rural drinking water supply schemes, Armed forces establishments and Central armed Police Forces establishments (in both rural and urban areas), Agricultural activities and Micro and Small enterprises drawing Ground water less than 10 cubic meters/day are exempted from seeking 'No Objection Certificate' (NOC).

(iv) All new/ existing industries and industries seeking expansion, infrastructure projects and mining projects extracting Ground water are required to seek NOC from CGWA or, the concerned State/ UT Ground Water Authority as the case may be.

(v) States / UTs are responsible for registering drilling rigs operating within their jurisdiction and for maintaining the database of wells drilled by them. Bulk water supply through tankers shall come under regulation regime.

(vi) New major industries as well as expansion cases with increased utilization of Ground water shall not be granted NOC in over-exploited assessment areas for industrial usage to conserve precious reserve except for MSME.

(vii) Grant of NOC to new infrastructure and Mining projects located in over-exploited assessment units is permitted.

(viii) Ground water abstraction/restoration charges have been introduced for extraction of Ground water. These charges have been devised based on the quantum of withdrawal and categorization of the area. The revenue generated from the proposed water abstraction/ restoration charges shall be kept in a separate fund for implementation of site-specific suitable demand/ supply side interventions.

(ix) Extraction of Ground water for commercial use by any of the proponents without a valid NOC shall be considered illegal and shall be liable to pay Environmental Compensation.

(x) Penalty shall be imposed on the proponents for non-compliance of NOC conditions.

4.3 When asked to state the measures initiated to contain the rampant exploitation of Ground water for the commercial purposes and how far they have been effective in attaining the intended objective, DoWR, RD & GR, in their written reply, stated as under:

"CGWA while issuing the NOC for any project where Ground water abstraction is for commercial purposes ensures that the recharge measures by the project proponents are commensurate with the quantum of Ground water abstraction and stage of Ground water development. CGWA also ensures that any renewal of NOC is not issued till all the compliance conditions of the NOC are implemented by the project proponent and the same is verified by the Regional Offices before recommending the case for issuance of NOC to the project proponent. Furthermore, as per the direction of Hon'ble NGT vide OA no. 176/2015 dated 11.09.2019, any industry drawing Ground water illegally are liable to pay environmental compensation to the respective State Pollution Control Boards."

4.4 In this regard, the Committee found that CAG, in its Performance Audit Report No. 9, 2021, has observed that *77 % of projects in 18 States where the Consent to Operate, granted to a project proponent included a condition which required NOC for Ground water extraction, were operating without NOCs. The huge number of defaulters indicates that a lack of mandatory linkage between the SPCBs/PCCs and CGWA has led to unchecked extraction of Ground water.*

4.5 Further asked about total number of cases of violations of CGWA Guidelines by industries in the last three years and action taken against such violators, the DoWR, RD & GR, in their post evidence written reply, stated as under:

"CGWA had started imposing suitable penalty for non-compliance of NOC conditions from November 2019 onwards. As per the available data, CGWA

had imposed penalty of Rs. one lakh/industry under Section 15 of the Environment (Protection) Act 1986 for non-compliance of NOC conditions on 20 Industries before the issue of new Guidelines. New Guidelines dated 24 Sep 2020 provide for imposition of penalty against violation of conditions of the NOC and Environmental Compensation for illegal withdrawal of Ground water."

4.6 When asked about the details of industries which have paid Environmental Compensation to the SPCBs, State wise and how effective it has been in creating sufficient deterrence, DoWR, RD & GR, in their written submission, furnished in August 2020, stated as under:

"The details of the industries/ companies that have paid environmental compensation to District Magistrate or CGWA are given in the table below:

Details of Environmental Compensation paid by proponents

Sl.No.	***State***	***Name of Industry/ Infrastructure project***	***Environmental Compensation Paid***	***Agency to whom paid***
1	*Gujarat*	*M/s Bhagirath Associates, F-3, Siddharaj Zavod, Sargasan, Gandhinagar, Gujarat.*	*Rs.4,90,080.00*	*DM, Gandhinagar*
2	*New Delhi*	*CISF and BPRD, New Delhi*	*Rs. 1,00,000*	*CGWA*
3	*Uttar Pradesh*	*C.L. Gupta Exports Pvt. Ltd., Village Jivai, J.P. Nagar-244221*	*Rs. 20,00,000*	*CGWA*
4	*Uttar Pradesh*	*M/s Beltek Canadian Water Ltd., Noida, UP*	*Rs. 10,00,000*	*CGWA*
5	*Uttar Pradesh*	*M/s Fast Food Pvt. Ltd., C-14, Site III, Merrut Road, District Ghaziabad, UP*	*Rs. 4,20,607*	*CGWA*

However, as per information received from Pollution Control Boards from the States/ UTs of Andhra Pradesh, Bihar, Dadra & Nagar Haveli, Daman & Diu, Haryana, Maharashtra, Odisha, Rajasthan, Uttar Pradesh and Uttarakhand, no Environmental Compensation has been paid to them by the industries/ companies.

It has been observed that the directions by Hon'ble NGT have compelled the proponents to abide by the stipulated norms and conditions laid by the CGWA for their strict adherence."

4.7 In response to another query on the level of environmental compensation fixed in the latest Guidelines to ensure compliance, the DoWR, RD & GR, in their post evidence reply, stated as under:

"As per the new Guidelines dated 24.09.2020, extraction of Ground water for commercial use by industries, infrastructure units and mining projects without

a valid NOC from appropriate authority shall be considered illegal and such entities shall be liable to pay Environmental Compensation for the quantum of Ground water so extracted.

The approved norms prescribed by Central Pollution Control Board (CPCB) are being utilized for calculating the Environmental compensation. Environmental Compensation Rate (ECR_{GW}) for illegal use of Ground water for various purposes such as drinking/domestic use, industrial activities such as water packaging units, mining and industrial sectors are given in tables below:

ECR_{GW} for Packaged Drinking Water units

S.No.	Area Category	Water Consumption (cum/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./ m^3			
1	Safe	12	18	24	30
2	Semi critical	24	36	48	60
3	Critical	36	48	66	90
4	Over-exploited	48	72	96	120
Note :-Minimum EC_{GW} shall not be less than Rs 1,00,000/-					

ECR_{GW} for Mining/ infrastructure dewatering projects

S.No.	Area Category	Water Consumption (cum/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./ m^3			
1	Safe	15	21	30	40
2	Semi critical	30	45	60	75
3	Critical	45	60	85	115
4	Over-exploited	60	90	120	150
Note :-Minimum EC_{Gw}shall not be less than Rs 1,00,000/-					

ECR_{GW} for Industrial units

S.No.	Area Category	Water Consumption (cum/day)			
		<200	200 to <1000	1000 to <5000	5000 & above
		Environmental Compensation Rate (ECR_{GW}) in Rs./m^3			
1	Safe	20	30	40	50
2	Semi critical	40	60	80	100
3	Critical	60	80	110	150
4	Over-exploited	80	120	160	200
Note: -Minimum EC_{Gw}shall not be less than Rs 1,00,000/-					

Deterrent Factors to compensate losses and environmental damage (for packaged drinking water units, mining, industries and infrastructural dewatering projects) have been introduced.

The following deterrent factors based on the duration of illegal Ground water extraction be applied to compensate for the losses and environmental damages as detailed in Table below:

Deterrent factor based on quantum of Ground water withdrawal and number of years of illegal withdrawal

S No.	*Water Consumption*	*Deterrence Factor*		
		< 2 years	*2-5 years*	*>5 years*
1	*<1000 KLD*	*1.00*	*1.00*	*1.25*
2	*1000-5000 KLD*	*1.00*	*1.00*	*1.50*
3	*>5000 KLD*	*1.00*	*1.25*	*2.00*

***Note**: KLD – Kilolitre per day*

4.8 When asked about study, if any, conducted by CPCB to assess the adverse impact of indiscriminate drawal of Ground water by Packaged Drinking water Industry on Ground Water table/ aquifers in the country, CPCB (MoEF &CC), in their post evidence reply, informed as under:

"Yes, CPCB has undertaken a study to assess the impact of indiscriminate drawl of Ground water by Packaged Drinking Water Industry on Ground Water table/ aquifers in the country through SPCBs/ PCCs. Based on the limited assessment carried out in 21 packaged drinking water units located in 06 States, it is observed that:

- *Based on the information provided, in a typical 50 KLD packaged drinking water manufacturing unit, about 1.7 KLD, RO reject is generated and is being discharged into drain without imparting any treatment. About 10.3 KLD, RO reject generated from first stage RO System is recovered through II Stage RO system and is recycled in the process.*
- *None of the States have reported about the existing provision for treatment of RO Rejects which may create shock loads to the end of pipe treatment system in a city or a town where terminal sewage treatment plants/CETPs are existing.*
- *Only 07 units have provided details with regard to the historical trend analysis with regard to increase or decrease in concentration of various parameters analysed by the respective Unit/SPCB.*
- *10 out of 21 units have only obtained Consent under Water (Prevention and Control of Pollution) Act, 1974 from respective State Pollution Control Boards by the Units.*
- *4 out of 21 units have obtained NOC from CGWA for abstraction of Ground water resources for manufacture of package drinking water. It clearly indicates that the package drinking water units are indulged in abstraction of Ground water resources without obtaining necessary approvals as required under various provisions.*
- *For convenience and to draw conclusions with regard to the characteristics of Ground water and bottled water characteristics as well as RO rejects, same are compared with BIS Drinking Water Specifications (IS:10500-2012) and Effluent Discharge Norms into Drain as prescribed under Schedule VI of E (P) Rules 1986 respectively.*

The study does not provide any conclusive evidence to show that discharge of effluents from PDW units studied have resulted in any significant adverse impact on the Ground water quality."

4.9 A query was raised about measures taken by the Government to encourage the conservation of water in the Industrial Sector by adopting water saving methods, recycling and reuse of water, etc. Replying to this, the Department, in their written reply, stated as under:

Central Ground water Authority is regulating Ground water withdrawal by industries / infrastructure/ mining projects in Non-Notified areas for which Guidelines/ criteria's have been framed and available on website www.cgwb.gov.in. NOC is granted subject to implementation of mandatory recycle/reuse as per following criteria.

Category of assessment unit based on Ground water development	***Mandatory Recycle/Reuse (for various purposes except recharge to Ground water)***
Safe	*Major and Medium Industries to recycle and reuse at least 40% of the waste water*
Semi- Critical	*Major and Medium Industries to recycle and reuse at least 50% of the waste water*
Critical	*Major and Medium industries should fully recycle and reuse the waste water*
Over- Exploited	*All Industries to fully recycle and reuse the waste water*

Chapter V

Contamination and Pollution of Ground water

5.1 Ground water is generally less susceptible to contamination and pollution when compared to Surface water bodies. Also, the natural impurities in rainwater, which replenishes Ground water systems, get removed while infiltrating through soil strata. But in India, where Ground water is used extensively for irrigation and industrial purposes, a variety of land and water based human activities are causing pollution of this precious resource. Their over-exploitation is causing aquifer contamination in certain instances, while in certain others their unscientific development with insufficient knowledge of Ground water flow dynamic and geo-hydro-chemical processes has led to their mineralization.

5.2 When asked to state the causes of Ground water pollution, DoWR, RD & GR, informed the following, in their written reply:

"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 Fluoride, Arsenic, Nitrate, Iron and Heavy Metals beyond the BIS permissible limit in isolated pockets in various parts of the country. High Salinity has been reported from 249 districts in 18 States, Fluoride beyond permissible limit has been encountered from 370 districts in 23 States, Nitrate from 423 districts in 23 States, Arsenic from 152 districts in 21 States, Iron from 341 districts in 27 States, Lead from 92 districts in 14 States, Cadmium from 24 districts in 9 States and Chromium from 29 districts in 10 States. State-wise details of contamination of Ground water is given in the following table:

States Wise Number of Partly Affected Districts with different Contaminants in Ground water of India

S.No	State/ UT	Salinity (EC above 3000 micro mhos/ cm) (EC : Electrical Conductivity)	Fluoride (above 1.5 mg/l)	Nitrate (above 45 mg/l)	Arsenic (above 0.01 mg/l)	Iron (above 1mg/l)	Lead (above 0.01 mg/l)	Cadmium (above 0.003 mg/l)	Chromium (above 0.05 mg/l)
1	Andhra Pradesh	12	12	13	3	7			
2	Telangana	8	10	10	1	8	2	1	1
3	Assam		9		19	18			
4	Arunachal Pradesh					4			
5	Bihar		13	10	22	19			
6	Chhattisgarh	1	19	12	1	17	1	1	1
7	Delhi	7	7	8	2		3	1	4
8	Goa					2			
9	Gujarat	21	22	24	12	10			
10	Haryana	18	21	21	15	17	17	7	1
11	Himachal Pradesh			6	1				
12	Jammu & Kashmir		2	6	3	9	3	1	
13	Jharkhand		12	11	2	6	1		

S.No	State/ UT	Salinity (EC above 3000 micro mhos/ cm) (EC : Electrical Conductivity)	Fluoride (above 1.5 mg/l)	Nitrate (above 45 mg/l)	Arsenic (above 0.01 mg/l)	Iron (above 1mg/l)	Lead (above 0.01 mg/l)	Cadmium (above 0.003 mg/l)	Chromium (above 0.05 mg/l)
14	Karnataka	29	30	29	2	22			
15	Kerala	4	5	11		14	2		1
16	Madhya Pradesh	18	43	51	8	41	16		
17	Maharashtra	25	17	30		20	19		
18	Manipur		1		2	4			
19	Meghalaya		1			6			
20	Nagaland		1			1			
21	Odisha	17	26	28	1	30			1
22	Punjab	10	19	21	10	9	6	8	10
23	Rajasthan	30	33	33	1	33	3		
24	Tamil Nadu	28	25	29	9	2	3	1	5
25	Tripura					4			
26	Uttar Pradesh	13	34	59	28	15	10	2	3
27	Uttarakhand			4		5			
28	West Bengal	6	8	5	9	16	6	2	2
29	Andaman& Nicobar	1				2			
30	Daman & Diu	1		1	1				
31	Puducherry			1					
	Total	**Parts of 249 districts in 18 States & UTs**	**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**	**Pb in parts of 92 districts in 14 States**	**Cd in parts of 24 districts in 9 States**	**Cr in parts of 29districts in 10 States**

Initial studies by CGWB indicated sporadic occurrence of high concentration of Salinity, Iron, Arsenic, Nitrate etc. at certain locations in the country. However, with increasing network of monitoring of water quality, more areas were found to have higher concentration of elements beyond permissible limit."

A. Ground water monitoring

5.3 Monitoring of Ground water regime by Central Ground Water Board (CGWB) is being carried out since 1969. At present, CGWB monitors Ground Water levels four times a year during January, April/ May, August and November through a network of 22730 observation wells spreading throughout the country. The periodicity of Ground Water level monitoring by the State Governments varies from State to State. The primary objective of monitoring the Ground Water level is to record the response of Ground Water regime to the natural and anthropogenic stresses on recharge and discharge components which are governed by geology, climate, physiography, land use pattern and hydrologic characteristics. Natural conditions affecting the regime include climatic parameters like rainfall, evapotranspiration etc. Anthropogenic influences include pumpage from the aquifer,

recharge due to irrigation systems and other practices like waste disposal etc. Based on the monitoring data, information pertaining to the status of Ground water regime is regularly disseminated to the concerned State agencies in the form of reports and maps. In order to disseminate the Ground water related data including point observations on water level and quality in public domain, a web based Ground Water Information System has been developed by CGWB in collaboration with National Informatics Center, New Delhi.

5.4 When asked about any survey of areas affected with Ground water contamination conducted to assess the extent of contamination, DoWR, RD & GR, in their post evidence reply, stated as under:

> *"Central Ground Water Board conducts water quality monitoring at regional level once in a year through a network of about 15000 observation wells located all over the country. Apart from these observation wells the quality is also monitored through various studies like Ground water management studies, Ground water exploration, Industrial/ pollution cluster studies etc. The Ground water monitoring activity is aimed to assess the extent of areas affected with water contamination."*

B. Role of CPCB and SPCBs to control the problem of pollution and contamination of Ground water

5.5 The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution and maintaining or restoring of wholesomeness of water, for the establishment of Boards for the prevention and control of water pollution, for conferring on and assigning to such Boards powers and functions.

5.6 Under this Act, CPCB was constituted in September 1974 as a statutory organisation. The principal functions of CPCB include promoting the cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution. CPCB, in collaboration with the SPCBs, monitors the water quality of aquatic resources across the country through a network of 4022 monitoring stations under the National Water Quality Monitoring Programme. The Environment (Protection) Act, 1986 also empowers CPCB & SPCB for protection, improvement of environment including addressing environmental pollution from various sources.

5.7 Ground water is also monitored by CPCB in association with SPCBs/PCCs at 1231 locations throughout the country under National Water Quality Monitoring

Programme (NWMP) except Andaman & Nicobar Islands, Arunachal Pradesh and Sikkim). The Ground water locations are monitored on a half yearly frequency for a set of parameters such as –

General: Colour, Odour, Temperature, pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS);

Nutrients: NO_2, NO_3, Orthophosphate;

Organic Matter: Chemical Oxygen Demand (COD);

Major ions: K+, Na^+, Ca^{++}, Mg^{++}, CO_3^{--}, HCO_3^-, Cl^-, SO_4^{--};

Other inorganics: Fluoride, Boron;

Microbiological: Total & Faecal Coliforms and

Micro-pollutants viz. Trace Metals including Arsenic and Pesticides.

The monitoring is carried out by SPCB/PCCs as per the Guidelines for Water Quality Monitoring, 2017 issued by MoEFCC.

C. National Water Quality Monitoring Programme (NWMP)

5.8 Under NWMP, Ground water quality monitoring stations are selected considering the criteria such as Drinking water sources located in sanitary conditions and prone to sewage contamination, preferably in shallow aquifer in the vicinity of septic tanks; sewage treatment plant; oxidation pond, cess pools, garbage dump sites, tube-wells, hand pumps or dug-wells located in industrial areas prone to contamination and are in use as well as Ground water sources in residential areas. Based on water quality assessment carried out during 2019 for parameters viz Total Dissolved Solids (TDS), Nitrate, Fluoride, Arsenic & Chromium and compared with BIS specifications for drinking water, IS 10500:2012, acceptable limits, the main observations are given below –

- **Nitrate** is exceeding at 20 locations in Delhi, 1 location each in Manipur, Odisha and Uttar Pradesh.
- **Total Dissolved Solids** is exceeding at 109 locations in Rajasthan, 72 in Gujarat, 43 in Delhi, 41 in Lakshadweep, 40 in Telangana, 34 West Bengal, 31 Andhra Pradesh, 27 in Madhya Pradesh, 25 in Punjab, 20 in Maharashtra,18 in Bihar, 17 in Uttar Pradesh,14 in Odisha ,13 in

Puducherry, 10 each in Himachal Pradesh and Daman, Diu & DNH, 09 in Tamil Nadu, 4 in Uttarakhand, 03 each in J&K & Chandigarh, 1 each in Assam, Goa, Karnataka & Kerala.

- **Fluoride** is exceeding at 74 in Rajasthan, 17 locations in Gujarat, 12 in Andhra Pradesh & Delhi, 10 in Maharashtra and Telangana, 07 in U.P., 05 in Punjab, 04 in Daman & Diu & DNH, 03 in Kerala & Odisha, 02 in Himachal Pradesh and Madhya Pradesh and 01 in Bihar, Karnataka, Meghalaya, Nagaland & West Bengal.
- **Arsenic** is exceeding at 01 location each in Assam and Delhi, 10 in Meghalaya, 26 in Telangana, 03 in Uttar Pradesh and 04 in West Bengal.
- **Chromium** is exceeding at 01 location in Delhi, Karnataka, 03 in Gujarat and 26 in Telangana.

5.9 When asked whether all the quality monitoring locations (1231) covered under NWMP are equipped with latest and state of art water technology equipment for monitoring Ground water quality and all these locations are sufficient to assess the water quality of the whole country or is there any proposal to widen the scope of NWMP, CPCB (MoEF &CC), in their post evidence reply stated as under:

> *"Monitoring under NWMP is carried out in accordance with The Guidelines for Water Quality Monitoring, 2017 (https://cpcb.nic.in/wqm/Guidelines_Water_Quality_Monitoring_2017.pdf). There are no latest and state of the art water technology equipment for monitoring Ground water quality at these selected 1231 locations. It is a monitoring location from where Ground water samples are collected and field observations are noted and reported based on the analysis of physico-chemical/ bacteriological/ trace metals and pesticides (prescribed under the afore-said Guidelines) carried out in Laboratories following standard methods of sampling and analysis (APHA Methods, Standard Methods for the Examination of Water and Wastewater, 23rd Edition).*
> *Existing Ground water monitoring network of CPCB under NWMP is enhanced from time to time emphasizing criteria."*

5.10 Asked further about the reasons for having less number of Ground water quality monitoring locations under National Water Quality Monitoring Programme (NWMP) in States such as Punjab and Uttar Pradesh which have 3.73% and 3.17% of the total Groundwater locations under NWMP but with severe problem of Groundwater contamination in these States, CPCB (MoEF &CC), in their post evidence reply informed as under:

"Presently, CGWA is monitoring Ground water quality at about 15600 locations which itself is adequate to assess the Ground water quality.

CPCB is also monitoring ground water under National Water Quality Monitoring Programme (NWMP) in accordance with the Criteria for identification and selection of monitoring location under NWMP, available on the link, https://cpcb.nic.in/wqm/Expansion-of-NWMP-21.02.2019.pdf. For the purpose of Ground water monitoring, the monitoring locations under NWMP are selected mainly emphasizing:

(a) Drinking water sources located in sanitary conditions and prone to sewage contamination, preferably in shallow aquifer in the vicinity of septic tanks, sewage treatment plant, oxidation pond, cess pools, garbage dump site etc.
(b) Tube-wells, hand pumps or dug-wells located in industrial areas and prone to contamination and are in use.
(c) Ground water sources in residential areas.
CPCB is continuously pursuing with the States/ UTs including Punjab and UP State Pollution Control Boards to propose new monitoring locations on Ground water depending on the need, for enhancement of existing monitoring network under NWMP".

D. Coordination among monitoring agencies for control of water pollution

5.11 Questioned about coordination between CGWB and CPCB for prevention of contamination of Ground water, DoWR, RD & GR, in their post evidence reply, informed, *inter-alia* as under:

"Data is being shared between CPCB and CGWB as and when required. CPCB and CGWB are deliberating on developing a common platform for capturing water quality data from all monitoring agencies."

5.12 On being asked about any proposal under consideration by DoWR, RD & GR to hold a meeting of all State Ministers, CPCB and SPCBs at the apex level under the chairmanship of Minister of Jal Shakti for discussing various matters relating to prevention and control of water pollution including functioning of STPs, the Department, in their post evidence reply, stated as under:

"Currently there is no comprehensive meeting being contemplated on the matter. Under the Chairmanship of Hon'ble Minister of Jal Shakti, 06 (six) meetings of the Empowered Task Force, constituted under Namami Gange Programme and consisting of Secretaries of various Ministries including of MoEF&CC, Chief Secretaries of five main Ganga Basin States and other officials from various Ministries, have been held. The last meeting was held on 25th September 2020."

E. Ground water quality in cities

5.13 Quality problem has also plagued the Ground Water resources of the cities where there are higher concentration of Salinity, Iron, Fluoride, etc. have been

found in the Ground water of cities. Some of the cities affected with geogenic concentration are - Agartala, Ahmedabad, Bhubaneshwar, Guwahati, Hyderabad, Jaipur, Delhi, Lucknow, Nagpur, Patna, Ranchi, Shillong, Srinagar, etc.

5.14 Contamination caused by domestic and industrial effluents is another major threat to Ground water in cities. Nitrate contamination is common in almost all the cities due to domestic effluents. Cities like - Ahmedabad, Bangaluru, Chennai, Lucknow, Nagpur, Delhi, Dehradun, Guwahati, Hyderabad, Jaipur, Kolkata, Patna, Panaji, Pondicherry and Trivandrum have reported anthropogenic contamination of Ground water.

F. Ground water contamination due to use of pesticides

5.15 Excessive use of chemical fertilizer and pesticides leads to contamination of drinking water supply. Punjab is called the Cancer Capital of India. When queried as to what extent contamination of Ground water due to presence of harmful chemicals/ heavy metals contributed to growth of cancer, DoWR, RD & GR, in their post evidence reply, stated as under:

> *"As per the available literature, long-term consumption of harmful chemicals/heavy metals such as Arsenic, Chromium, Lead and organic chemicals including pesticides in Ground water may contribute to the growth of cancer in human."*

G. Presence of Uranium in the Ground water of Rajasthan and Bihar

5.16 In reply to a specific query on the presence of Uranium by more than the permissible limit in the drinking water of Rajasthan and also whether uranium as an element/mineral has been considered as a contamination criteria like arsenic, fluoride and nitrate by the Bureau of Indian Standard (BIS), DoWR, RD & GR, in their post evidence reply, stated as under:

> *"Yes, the presence of Uranium element, more than the permissible limit has been observed in few isolated pockets of Rajasthan where Ground water is being used for drinking purposes.*
>
> *The Indian Standard IS 10500: 2012 for Drinking Water specification has specified the maximum acceptable limit for radioactive residues as alpha and beta emitters, values in excess of which render the water not suitable. These requirements take into account all radioactive elements including Uranium. No individual radioactive elements have been specifically identified.*
>
> *Further, as per information provided by Bureau of Indian Standard (BIS), they are working to incorporate maximum permissible limit of Uranium as 0.03 mg/l (as per WHO provisional guidelines) in all drinking water standards after following due process."*

5.17 Further in reply to a question raised in the Seventh session of Parliament, the Hon'ble Minister of State for Jal Shakti informed that Central Ground Water Board (CGWB) carried out water quality assessment with respect to uranium in Ground Water for the entire country including Bihar for the first time during 2019. As per this assessment, the occurrence of uranium in Ground Water beyond the BIS permissible limits (0.03 mg/l) of drinking water was observed in parts of certain districts in Bihar viz. Saran, Bhabhua, Khagaria, Madhepura, Nawada, Sheikhpura, Purnea, Kisanganj and Begusarai. He further informed that the Department has not conducted any specific study on impact of use of Ground Water with excess uranium concentration on human health. However, health studies carried out elsewhere in the world suggest that elevated uranium level in drinking water may be associated with kidney toxicity.

5.18 Queried about the steps taken by the Ministry of Jal Shakti to prevent the contamination of water by Uranium, DoWR, RD & GR, in their post evidence reply, submitted as under:

> *"Central Ground Water Board has taken pro-active steps for monitoring of Uranium contamination in shallow Ground water through a network of approximately 15000 observation wells located all across the country to assess the extent of Uranium contamination in shallow Ground water during year 2019-20 and analyses of samples are under progress.*
>
> *Rural drinking water is a State subject and Government of India supplements the efforts of State Government by providing financial and technical assistance to provide potable water to rural population through the Centrally Sponsored Scheme Jal Jeevan Mission (JJM). While allocating the funds to States/UTs under JJM, ten percent weightage has been given to the population residing in habitations affected by chemical contaminants. The funds provided under JJM can be utilized for taking up schemes in water quality affected areas on priority."*

H. Measures taken by the Government to prevent contamination of Ground water

5.19 Asked to state the steps initiated by Ministry of Jal Shakti to provide safe drinking water in both the rural and urban habitations which are affected with water quality contamination, DoWR, RD & GR, in their post evidence reply, stated as under:

> *"Drinking water is a State subject and Government of India supplements the efforts of States by providing financial and technical assistance to States/UTs. It is the States that plan, design, approve, implement, operate and maintain water supply schemes.*

To enable every rural household in the country to have potable water at service level of 55 litre per capita per day (lpcd) through Functional Household Tap Connection (FHTC) by 2024, Government of India, in partnership with the States, has launched Jal Jeevan Mission (JJM) with an estimated cost of Rs. 3.60 lakh crores. Powers to plan, approve, and implement rural drinking water supply schemes are vested with States. While allocating the funds under JJM to States/ UTs, 10% weightage has been given to the population residing in habitations affected by chemical contaminants. The funds provided to the States/ UTs under JJM can be utilized for taking up schemes in water quality-affected areas on priority. All States/ UTs have been advised to prioritize provision of Functional Household Tap Connections (FHTCs) in water quality affected areas. In Arsenic and Fluoride affected habitations where planning and implementation of piped water supply schemes based on a safe water source will take time, as a purely interim measure, States are allowed to take up Community Water Purification Plants (CWPPs) schemes to provide 8-10 lpcd potable water to meet drinking and cooking need of every household residing in such villages/ habitations.

In March 2017, National Water Quality Sub-Mission (NWQSM) was launched 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.

One of the components of the AMRUT mission of MoHUA which covers 500 cities across India pertains to water supply. Out of Rs.77,740 crore allocated for projects under the mission, Rs.39,010 crore (50%) has been allocated to water supply. The key objective of AMRUT is universal coverage of water supply in the mission cities. The cities as per their requirement can choose projects under water supply ranging from water distribution, treatment, source augmentation, rainwater harvesting, rejuvenation of water bodies for drinking water supply and special water supply arrangement for difficult areas, hills and coastal cities including those having water quality problem."

I. Ground water pollution through discharge of effluents from industries

5.20 Effluent discharge from industries has aggravated the problem of Ground water pollution and contamination. While furnishing the details of the major industrial contributors in Ground water pollution, the DoWR, RD & GR, in their post evidence reply, informed the Committee as under:

"Major contributors of pollution in terms of organic load are distilleries followed by paper mills. A large number of paper mills are in small-scale sector and these industries do not have adequate arrangement for treatment of wastewater. The other significant contributors of organic load are sugar and textile industries.

The industries generating chemical pollution can be divided in two categories i.e. i) those which generate high TDS bearing wastes like pharmaceuticals,

rayon plants, chemicals, caustic soda, soap and detergents, smelters etc. (ii) those which generates toxic wastes e.g. pesticides, smelter, inorganic chemicals, organic chemicals, steel plants, pharmaceuticals and tanneries etc. Major contributors of TDS load are distilleries followed by pharmaceuticals, textile industries and rayon plants. Major contributors of suspended solid load are thermal power plants."

5.21 When the Committee desired to know the details of the State/UT wise pockets/regions where the problems associated with the untreated industrial discharge, landfills/sub-surface injection of chemicals and hazardous waste(s) are posing the maximum threat to Ground water pollution in the country, the DoWR, RD & GR, in their written reply, stated as under:

"CGWB carried out water quality studies in all the 88 industrial clusters identified by CPCB. The studies indicated that in most of the cases excess concentration of few chemical constituents beyond norms prescribed by BIS are present.

Major Inferences

- *Contamination in Ground water was reported from nearly 90% of the clusters.*
- *Contamination wherever reported were mostly for the phreatic aquifers.*
- *Constituents which were reported beyond permissible limit show very high variation in terms of major constituents. Cl & NO_3 are the most common ions which were reported beyond permissible limit.*
- *In most of the cases, heavy metals which were reported included Fe, Mn, Pb and Cu.*
- *Since the clusters included various types of industries, it was not possible to relate specific types of constituents to specific types of industries. However, some specific conclusions regarding Ground water pollution by specific types of heavy metals may be drawn.*
- *Pharmaceutical, Petroleum, Dyeing units are generally present in such clusters like Varanasi, Vapi & Ludhiyana etc. In these areas, mostly Pb and Mn occur beyond permissible limit in few samples.*
- *Chromium (Cr) the other major pollutant mostly occurs in industrial clusters where leather industries and tanneries are operational in large extent like in Kanpur, Agra, Vellore & Vapi.*
- *Cadmium (Cd) is another heavy metal which occurs where industries of petroleum and petroleum products are in operation.*
- *The occurrence of Iron (Fe) in proportions more than permissible limit has been reported in many industrial clusters. Though contamination of Iron is generally geogenic but their occurrence in industrial clusters may be because of anthropogenic pollution.*

- *The occurrence of nitrate beyond permissible limit in most of the industrial clusters is generally man made problem associated with sanitation system (want of proper sewerage system).*

- *Presence of other basic elements in excess of permissible limit like salinity may be due to geogenic causes.*

Further, CGWB has carried out a preliminary study at select large packaged drinking water units in the States of Uttar Pradesh, Punjab, Haryana, Assam and Uttarakhand. The study indicated that the Ground water in the premises of the Packaged Drinking Water Units is potable in general, with almost all chemical parameters within the limit prescribed by BIS for drinking purposes."

5.22 When asked to state the frequency of study conducted by CGWB in 88 industrial clusters, DoWR, RD & GR, in their post evidence reply, stated as under:

"The (Ground water quality in Industrial clusters) study was conducted during 2010-11 and again repeated in 2013-14. Out of the studies completed in 88 industrial clusters, contamination wherever reported were mostly in the phreatic aquifers. Due to high values of various constituents (Pb/ Mn/Cr/Cd) present in the Ground water samples from industrial clusters, 45 areas have been classified as Critically Polluted Areas (CPAs)…
Further, CPCB conducted assessment of Comprehensive Environmental Pollution Index (CEPI) scores [which is a rational number (ranging from 0 to 100) to characterize environmental quality at a given industrial areas following algorithm of pollution source, pathway and receptor] in 2018 at 100 identified industrial clusters (including above- mentioned 88 industrial clusters) in 21 States across the country. Out of the assessed 100 industrial clusters, 38 industrial clusters have been identified as CPAs (with CEPI scores of 70 and above) and 31 industrial clusters have been identified as Severely Polluted Areas (SPAs)."

J. Abatement of Ground water pollution caused by the industries

5.23 While furnishing the details of measures taken by the CPCB for abatement of Ground water pollution, CPCB (MoEF &CC), in their post evidence reply, stated as under:

"Initiatives of CPCB to control water pollution are detailed below:

- *CPCB has made a comprehensive programme on water pollution for controlling point sources by developing industry specific standards and general standards for discharge of effluents and same are notified under The Environment (Protection) Act, 1986 by MoEF& CC, Govt. of India.*
- *A mutually agreed Time-Targeted Action Programme have already been implemented under Corporate Responsibility on Environment Protection (CREP).*
- *Establishment of Common Effluent Treatment Plants (CETPs) for cluster of Small Scale Industries.*

- *Online Continuous Effluent Monitoring Systems (OCEMS) are installed by the industrial units in the country through directives issued by CPCB for getting real time information on the effluent quality and non-complying unit were identified for follow-up inspections and actions.*
- *Zero Liquid Discharge (ZLD) has been implemented in a number of categories of industries to protect the water quality in view of lean flow situation in rivers and streams in a larger non monsoon period.*

Actions initiated by SPCBs/ PCCs:

- *Notified Industry Specific Discharge Standards and General Standards are enforced by the State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) through consent mechanism in respective State/ UT.*
- *The consent mechanism implemented by SPCBs/PCCs for control of pollution is reviewed from time to time. Location specific and industry specific issues are addressed through interaction with SPCBs/PCCs regularly.*
- *Enforcement of stringent norms especially Zero liquid discharge for a certain group of industries have been implemented by use of multiple evaporator systems to regulate highly concentrated waste. The specific groups of industries which are unable to treat the waste water to notified norms have been directed to implement zero liquid discharge.*

Success achieved in attaining the objective of reducing/ controlling water pollution especially Ground water is largely negated due to unabated growth of population and resultant waste water generation from the urban centres. On the other hand, uncontrolled abstraction of Surface and Ground water is compounding the problem by creating the situation of low flow or no flow in the river/streams; and the depletion of Ground water yielding to reduction in recharge potential of Surface water sources from Ground water seepages.

Issues related to water pollution including Ground water are addressed by SPCBs/ PCCs/ CPCB in a coordinated manner at various platforms including Conference of Chairmen and Member Secretaries organized by CPCB at regular intervals. Conference of Chairmen and Member secretaries of CPCB & SPCBs/PCCs is organized periodically (at least once in a year) to review various projects/ activities among the Pollution Control Boards. The conference is a forum to bring all the issues of States and to share the success stories for control of pollution."

5.24 When asked about the steps taken to contain the Groundwater Pollution in the identified areas, CPCB (MoEF &CC), in their post evidence reply informed as under:

"All the SPCBs/PCCs are required to prepare and implement the time bound action plans for improvement of environmental quality in the identified CPAs, so as to bring down the CEPI scores within limit. Already, action plans for 30 CPAs have been prepared by the concerned SPCBs and for the remaining 8 CPAs, the same is under process.

Further, CPCB requested SPCBs/PCCs to identify sources of pollution in CPAs, assess contribution of industries and to consider stringent effluent and emission norms, as per the requirement, besides implementation of area specific action plans."

5.25 A query was raised on total number of factories, industry-wise, operating in Metros/Cities with functioning STPs and frequency of physical verification along with deficiencies found and penal measures taken against the erring factories. On this, CPCB (MoEF &CC), in their post evidence reply informed as under:

"As per the information received from SPCBs/PCCs, out of total 72,314 number of industries requiring ETPs, 70,555 industries are operating with functional ETPs and 1,759 industries are operating without ETPs. Show-cause notices and closure directions have been issued to 746 and 857 industries, respectively for operating without ETPs.
Legal cases have been filed against 5 industries and action is under process for 151 industries. Out of 70,555 operational industries, 69,515 industries are complying with environmental standards and 1,040 industries are non-complying. Show-cause notices and closure directions have been issued to 466 and 206 industries, respectively for non-compliance. Legal cases have been filed against 12 industries and action is under process for 356 industries. State-wise status of water polluting industries is given at Annexure-I.
CPCB vide direction dated 12.12.2019, issued u/s 18(1)(b) of Water Act, 1974 and Air Act, 1981, directed all SPCBs/PCCs to implement following inspection frequency for environmental surveillance of industries.

Sl. No.	*Industrial Category/Facility*	*Frequency of Mandatory inspection for Environmental Surveillance*
1.	*Highly Polluting 17 Category industries*	*3 months*
2.	*Red Category (Other than 17 category industries)*	*6 months*
3.	*Orange Category industries*	*1 Year*
4.	*Green Category industries*	*2 Years*
5.	*CBWWTF/CHWSRDF/MSWTDF/CETP/STP*	*3 months*

5.26 Regarding the total number of industries located on the banks of rivers with functional STPs, no specific reply was furnished by CPCB. However, during the course of oral evidence held on 18.1.2021, Chairman, CPCB stated following with regard to the action taken against erring industries:

"From 2017 onwards, we are constantly getting Third party verification of all industries situated on the banks of Ganga and Yamuna. Wherever violations are found, industries are closed. This year we have inspected 1080 industries on the bank of Ganga and 10,667 industries on the banks of Yamuna and Hindon. We are directly supervising work of SPCBs and PCCs… Treatment

Plants have been installed only in the Grossly Polluting industries. There are around 3500 Treatment Plants which provide details to SPCBs on daily basis."

5.27 On being enquired about punitive action/ penalty imposed against erring industries, particularly Grossly Polluting Industries (GPI) for violation of norms relating to effluent discharge, CPCB (MoEF&CC), in their post evidence reply, stated as under:

"The compliance status of Grossly Polluting Industries (GPIs) located in Ganga main stem for 2017, 2018 and 2019 is annexed as Annexure-II.
73 closure directions and 10 directions for imposition of Environmental Compensation have been issued to the non-complying industrial units.
The GPIs, which are found non-complying or which do not adhere to prescribed norms, are issued directions under Section 5 of Environment (Protection) Act, 1986 and also levied EC. Sector-wise status of GPIs on which EC is imposed by CPCB is as below:

Sectors	*No. of GPIs imposed*	*Sum of EC imposed (Rs.)*	*Sum of EC deposited in ESCROW account (Rs.)*	*Sum of EC deposited in CPCB account (Rs.)*	*Total EC Deposited (Rs.)*
Distillery	*4*	*8,77,20,000*	*-*	*8,77,20,000*	*8,77,20,000*
Food & Dairy	*2*	*9,00,000*	*-*	*9,00,000*	*9,00,000*
Sugar	*38*	*6,12,00,000*	*3,45,19,925*	*3,18,80,305*	*6,64,00,230*
Textile	*1*	*1,87,500*	*-*	*1,87,500*	*1,87,500*
Total	*45*	*15,00,07,500*	*3,45,19,925*	*12,06,87,805*	*15,52,07,730*

5.28 Asked to state the problems/ constraints being faced in regulation and prevention of Ground water pollution, MoEF &CC, in their post evidence reply informed as under:

"Regulation of Ground water falls under the purview of Central Ground Water Authority (CGWA) constituted under The Environment (Protection) Rules, 1986.
Water pollution has not been adequately addressed in any policy in India, both at the Central and the State level. Absence of a specific water pollution policy incorporating prevention of water pollution, treatment of polluted water and ecological restoration of polluted water bodies revealed inadequate Government efforts in these areas.
Abstraction of Ground water for industrial use requires 'NOC' from CGWA and this requirement has to be ensured or enforced strictly by CGWA as well as SPCBs/ PCCs while granting 'CONSENT' under The Water (Prevention and Control of Pollution) Act, 1974.
Water being a State subject, policy at grass root level is being implemented by State Govt. agencies, many a times an aquifer is shared by two or more States and policy implementation is difficult at times and thus, regulation and prevention of ground water pollution.

Multiple agencies are involved at Central and States level in regulating and abatement of Ground water pollution. The conditions laid down by CGWA in NOC issued are seldom monitored. After repeal of Water Cess Act, SPCBs have stopped gathering data on water consumption by the municipalities, local bodies and industrial units. There is no check on withdrawal exceeding the recharges in view of above reasons."

5.29 During the course of oral evidence held on 18 January, 2021, a query was raised with regard to powers vested with authorities/regulatory bodies for enforcement of Guidelines, responding to which the Secretary, MoEF&CC stated as under:

"Sir, under the Water Pollution and Prevention Act, most of the power has been vested with the SPCBs. CPCB has been entrusted with the responsibility to decide norms for industries. However, SPCBs also do not have power to impose fine. They have to go to courts for imposition of fine of small amounts . They can however, ask for closure of the violating industry. Therefore, generally, they rather prefer to give notice for closure of the violators than imposing fines, that too of small amounts. So SPCBs are not equipped with adequate powers to bridge the gap between violations liable for penalty and violations necessitating closure of the industry. In order to address this lacuna, we will introduce amendment to the Act in Parliament."

5.30 When MoEF&CC was asked to furnish their views on changes required in the extant Water Pollution and Prevention Act, 1974 to make it more effective to address the problem of water pollution in the country, CPCB (MoEF&CC), in their post evidence reply, stated following:

"The Water Act, 1974 does not have provisions, nor empowers CPCB or SPCBs to levy or impose fine upon violators of said Act. The absence of such empowerment does not act as deterrent to habitual offenders causing water pollution."

K. Real time monitoring of effluent discharge by industries

5.31 Queried about the measures taken by CPCB to ensure that proper treatment of waste water is done by industries before their discharge/ disposal, MoEF &CC, in their post evidence reply informed as under:

"Effluent discharge standards have been notified for industries and it is mandatory for industries to treat effluents up to prescribed standard before final discharge. CPCB has issued directions to all 17 category of highly polluting industries to install OCEMS with real time data connectivity to CPCB. CPCB conducts regular inspections of the industries based on exceedance alerts of OCEMS or offline OCEMS. Based on the observations of inspections, CPCB takes action on the defaulter industries as per extant rules."

5.32 When asked about fixing any norms/ parameters for assessing the quality of treated / recycled water and their suitability for different uses/consumption including

for irrigation purposes, CPCB (MoEF &CC), in their post evidence reply stated as under:

> *"MoJS is in the process of finalization of Policy in this regard by bringing out standards/limit for treated or used water to utilize/recycle in various sectors including agriculture. However, the general standards are notified under The Environment (Protection) Rules, 1986 for discharge of environmental pollutants. In addition to this, industry specific standards for discharge of environmental pollutants from various industries are also notified under The Environment (Protection) Rules, 1986.*
> - *In the above, standards for effluents discharge are mentioned for inland surface water, public sewers, land for irrigation and marine coastal areas.*
> - *Industries having lands for irrigation can use treated effluent for irrigation only after complying with the discharge standard norms."*

5.33 Questioned as to whether there is any online system of reporting the volume of treated water being discharged in rivers/canals/ground on daily basis, MoEF &CC, stated following, in their post evidence reply:

> *"CPCB has developed mobile-based application on STP monitoring. The app is developed for synchronization of flow of data from STPs operator to regulatory authorities. CPCB has forwarded the User Id and Password for individual STPs as per inventory provided by SPCBs / PCC to Principal Secretary, Urban Development to use the application and upload the data on weekly basis vide letter no. A-14011/1/2020-UPC-I/9744-9779 dated 03.11.2020.*
>
> *Further, for strengthening monitoring mechanism and effective compliance through self-regulatory mechanism, CPCB has directed all 17 categories of highly polluting industries to install Continuous Effluent/ Emission Monitoring Systems for constant vigil on pollution levels. Since 2016-17, CPCB started inspection of 17 categories of highly polluting industries based on the computer generated SMS alerts, due to violation of effluent and emission standards, recorded in OCEMS. Industries are selected for inspection on the basis of SMS generated from the online monitoring systems installed in these industries.*
>
> *CPCB has inspected total 709 industries from October, 2016 to January, 2021, under SMS Alerts Scheme. Out of which, 348 industries were found non-complying. As per the provisions of Section 5 of Environment Protection Act, 1986, show-cause notices/technical directions to 163 units and closure directions to 183 units were issued for non-compliance. Further, one direction each to Assam and Maharashtra SPCB, was issued under section 18(1)(b) of the Water and Air Act. Out of 348 units found non-complying during inspection, 306 units are complying as on date."*

L. Strengthening of CPCB and SPCBs

5.34 Asked further as to whether there is sufficient manpower (both in technical and non-technical grades) in the CPCB to carry out activities in relation to

regulation/monitoring for prevention of water pollution in general and Ground water in particular, MoEF &CC, in their post evidence reply informed as under:

> *"Manpower study for CPCB was conducted by IIPA in 2016. They have assessed the additional requirement of 207 posts for smooth functioning of CPCB. CPCB is facing manpower crunch for discharging of their duties. Manpower in CPCB has not increased since last two decades despite manifold increase in work load."*

5.35 In response to another query on SPCBs as to whether they are well equipped with required manpower and machinery to monitor and control water quality, MoEF &CC, in their post evidence reply, informed as under:

> *Over time, with the widening legal umbrella, manifold increase in industries and stakeholders and expanding civil society activism, role and functions of State Boards have expanded and evolved, but without a corresponding increase in capacity or resources. As a consequence, Boards are not being able to fulfill their role. State-wise monitoring details are given below:*

S. No.	SPCB / PCC	Number of Stations				Analytical Facilities
		NWMP	SWMP	RTWQM	GW	
1	Andaman & Nicobar	0	0	0	-	Outsourced
2	Andhra Pradesh	51	59	0	33	At Visakhapatnam Zonal Laboratory *
3	Arunachal Pradesh	18		0	0	8 WQM parameters
4	Assam	196		0	64	Physical, general and non-metallic, metals, organics, microbiological, toxicological, biological,
5	Bihar	161		0	70	Information not received
6	Chandigarh	11	0	0	7	24 parameters within CPCC and others from external labs.
7	Chhattisgarh	39		0	8	20 Major Parameters
8	Daman & Diu and Dadra & Nagar Haveli	28		0	12	Outsourced

9	Delhi	9		2	46	8 Physical, 12 General & Non-Metallic, 12 Metals, 4 Organics
10	Goa	61		0	10	9 Physical, 12 General & Non-Metallic, 14 Metals, 5 Organics
11	Gujarat	165	0	0	89	14 Physical, 17 General & Non-Metallic, 28 Metals, 12 Organics
12	Haryana	26		0	28	Information not received
13	Himachal Pradesh	148	178	0	49	Physico-chemical, Microbiological and Heavy Metals.
14	Jammu and Kashmir	103	33	0	23	Physical, General Non-Metallic, Trace Metals and Organics
15	Jharkhand	53		5	3	Information not received
16	Karnataka	280	50	2	2	15 Physical, 17 General & Non-Metallic, 26 Metals, 10 Organics
17	Kerala	128	152	1	34	29 Mandatory, 32 Secondary
18	Lakshadweep	45		0	42	11 Parameters
19	Madhya Pradesh	188	64	1	54	14 Physical, 17 General & Non-Metallic, 28 Metals, 10 Organics
20	Maharashtra	250	44	0	50	5 Physical, 42 Chemical
21	Manipur	70		0	10	Information not received
22	Meghalaya	81		0	13	13 Physical, 15 General & Non-Metallic, 16 Metals, 3 Organics
23	Mizoram	76		0	26	Physico-chemical, Microbiological. Heavy metals and pesticides samples sent to the CPCB for analysis.

24	Nagaland	28		0	10	26 Physico-chemical and Metals
25	Odisha	208	4	3	90	14 Physical, 18 General & Non-Metallic, 19 Metals, 10 Organics
26	Puducherry	31	3	0	22	28 Physico-Chemical, 22 Pesticides
27	Punjab	100 (46 GW)		0	46	33 Physico-Chemical, 12 Pesticides, 20 Heavy Metals, 3 Biological
28	Rajasthan	199		0	139	11 Physical, 12 General & Non-Metallic, 18 Metals, 3 Organics
29	Sikkim	14		0	-	14 Physico-chemical
30	Tamil Nadu	55		3	22	10 Physical, 16 Non-metallic, 17 Trace Metals, 6 Organics
31	Telangana	210	185	2	45	All the Parameters of Appendix – A *
32	Tripura	100		0	57	Physical 6, Chemical 17, Metals 10
33	Uttar Pradesh	117	24	16	40	Parameters as per Appendix – A *
34	Uttarakhand	58	12	1	19	Physico-chemical 16
35	West Bengal	137	17	10	68	Parameters as per Appendix – A *

Note: *NWMP = National Water Quality Monitoring Network,*
SWMP = State Water Quality Monitoring Network,
RTWQM = Real Time Water Quality Monitoring
GW = Ground Water
** Parameters listed in Appendix – A of Guidelines for Recognition of Environmental Laboratories under E.P. Act 1986.*

5.36 In response to a query on the details of the budgetary allocation (both BE and RE) and utilization of funds by the CPCB during the last five years and budgetary constraints, if any, being faced, in the discharge of their functions and implementation of various programmes/works, MoEF &CC, in their post evidence reply informed as under:

Budgetary allocation during the last 05 years:

Financial Year	***Budget Estimate (BE) (in Crores)***	***Revised Estimate (RE) (in Crores)***	***Utilized (in Crores)***
2016-17	*70.15*	*88.19*	*88.19*
2017-18	*74.30*	*118.80*	*118.80*
2018-19	*100*	*114.42*	*114.42*
2019-20	*186*	*100*	*100*
2020-21	*200*	*100*	*83*

Yes, CPCB has been facing budgetary constraints in the discharge of their functions and implementation of various programmes/works as shown in the table above.

Chapter VI

Flagship programmes for Ground water management and their achievements

6.1 CGWB is continuously striving under the aegis of the Ministry of Jal Shakti to achieve the desired targets as per their mandate. They have been working in the field of Ground water exploration and could map a substantial portion of India into various aquifer systems under NAQUIM program. They are continuously interacting with States/UTs and providing technical inputs for sustainable management of water resources.

A. National Aquifer Mapping and Management Programme (NAQUIM)

6.2 NAQUIM was initiated in 2012 with the objective to delineate and characterize the aquifers and develop plans for Ground water management. A multi-disciplinary approach including geological, geophysical, hydro-geological, hydrological and water quality studies is being followed for preparation of aquifer maps and management plans. Aquifer maps and management plans developed under this programme are backed by rigorous field surveys by the professional hydro-geologists of CGWB in different regional offices. Aquifer maps and management plans, thus prepared are subject to review at various levels.

6.3 Out of nearly 32 lakh km^2 of the entire country, approximately 25 lakh km^2 of mappable area has been identified to be covered under this programme in phases. Asked to state the time period by which the entire mappable area of aquifers will be mapped, DoWR, RD & GR stated following in their written submission:

> *"The total area identified for coverage under the Aquifer Mapping programme is 24.8 lakh sq km... it is envisaged to cover the remaining 11.8 lakh sq km by 2022- 2023. All out efforts are being made by CGWB for completing the envisaged targets of Aquifer Mapping within the timelines."*

6.4 When asked about any functional/institutional/financial problems being faced by the Department in the execution of this programme, the DoWR, RD &GR, in their written submission, stated as under:

> *"The Ministry has not faced any problem so far. However, to expedite the aquifer mapping program the data generation activities of CGWB have been outsourced to M/S WAPCOS Ltd which has been engaged as Project Management Consultant."*

6.5 With regard to the work of aquifer mapping undertaken by the CGWB, the CAG in its Report No.9, 2021 observed that *CGWB took eight years to cover 52 per cent of the total identified area of 24.8 lakh sq. km. Considering the time still required to complete aquifer mapping of the remaining 11.8 lakh sq. km, the Department needs to develop a strategy for completing the work within a reasonable time period.*

B. Ground water management in identified water stressed areas - Atal Bhujal Yojana (ATAL JAL)

6.6 Atal Bhujal Yojana (ATAL JAL) is a Central Sector Scheme of the Government of India with an outlay of Rs 6000 crore, with focus on community participation and demand side interventions for sustainable Ground water management in identified water stressed areas. This scheme is expected to contribute significantly towards the water and food security of the participating States. The scheme was launched by the Hon'ble Prime Minister on 25.12.2019 and is being implemented from 1.04.2020 for a period of 5 years.

6.7 The scheme is being taken up in select areas that include 80 districts, 222 administrative blocks and 9000 water stressed Gram Panchayats (GPs) of seven States, viz. Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh. The State wise details of area and financial allocations are as under:

Details of area & tentative financial allocations

S.No	State	Districts	Blocks	GPs	Area (sq.km)	Financial Allocation (Rs. in Crore)
1	Gujarat	7	34	2,201	18,187	756.76
2	Haryana	13	36	1,895	12,650	723.19
3	Karnataka	14	41	1,199	39,703	1201.52
4	Madhya Pradesh	6	9	672	8,300	314.54
5	Maharashtra	13	35	1,339	13,209	925.77
6	Rajasthan	17	38	1,144	32570	1189.65
7	Uttar Pradesh	10	26	550	13,134	729.24
	National Program Management Unit					159.33
	TOTAL	**80**	**222**	**9000**	**1,37,358**	**6000.00**

The details of action/work done under the Scheme since their inception is furnished below:

- National Inter-Departmental Steering Committee has been constituted & NPMU has been established.
- MoA has been signed with all seven States.
- Program Guidelines have been prepared and shared with States.
- TPGVA for independent verification of achievements of the State has been engaged and has begun the process of 1st round of verification of achievements in respect of DLI for disbursement of incentives.
- Preparation of web-based MIS to monitor progress of the scheme has advanced.
- Establishment of institutional mechanism for implementation of scheme is in progress in the participating States.
- States are going ahead with various activities like engagement of experts, district implementation partners, preparation of tenders etc. for ground level implementation of the scheme.

6.8 While replying to a query raised in the Sixth session of Parliament, the Hon'ble Minister of State for Jal Shakti and Tribal Affairs informed that based on the criticality of Ground Water situation, willingness and degree of preparedness, States were selected by the Government of India for implementation of Atal Bhujal Yojana, while Districts, Blocks and Gram Panchayats were selected by the concerned States.

6.9 During the examination of the Demands for Grants (2021-22), the Committee, in their 10th Report recommended that *the Atal Bhujal Yojana scheme should be broad based and implemented at pan India level so as to cover all the water scarce regions and districts of the country particularly in those States having large number of over-exploited blocks.*

6.10 When asked about any proposal under consideration to extend the Scheme to other States/UTs in the Country so as to cover more water stressed districts, the DoWR, RD & GR, in their post evidence submission, stated as under:

> *"Atal Bhujal Yojana is a pilot being implemented in identified water stressed areas of seven States, viz. Gujarat, Haryana, Karnataka, Madhya Pradesh,*

Maharashtra, Rajasthan and Uttar Pradesh. Based on the lessons learnt from implementation of the Scheme and their efficacy/outcome in improving the long-term sustainability of Ground water resources, feasibility of up scaling the Scheme to other parts of the Country could be considered with the approval of competent authority."

6.11 Asked to furnish the details of total amount of funds allocated to each of the States under the programme vis-à-vis their utilization, the DoWR, RD & GR, in their post evidence submission, stated as under:

The details of total amount of funds allocated and released to each State under the Scheme is shown in the table below:

S.No.	State	Allocation (Rs. In crore)	Release (Rs. In crore)	Remarks
1.	Gujarat	756.76	4.12	Rs. 159.33 crore is allocated to National Program Management Unit of Atal Jal.
2.	Haryana	723.19	4.90	
3.	Karnataka	1201.52	12.10	
4.	Madhya Pradesh	314.54	1.48	
5.	Maharashtra	925.77	3.52	
6.	Rajasthan	1189.65	4.95	
7.	Uttar Pradesh	729.24	2.93	
	Total	**5840.67**	**34.00**	

C. Master Plan on Artificial Recharge to Ground water

6.12 The Committee have been informed that the changing pattern of rainfall with heavy downpour for a few days and widespread concretization allows very less water to seep through the ground resulting in less recharge in the ground. In order to enable sufficient recharge of Ground water, CGWB had prepared Master Plan for artificial Recharge to Ground water in the year 2013, which was the revision of the conceptual plan made in 2002.

6.13 When asked about specific action plan mooted by the Ministry to recharge Ground water involving all the stake holders, DoWR, RD & GR, in their written submission, stated as under:

"One of the important measure to conserve surplus rainfall runoff is artificial recharge to Ground water. CGWB has prepared a Master Plan for Artificial Recharge to Groundwater- 2020, which is a macro plan formulated to work out the feasibility of various structures for the different terrain conditions of the country and respective estimated cost, providing a broad outline of the project and expected investments. The Master Plan envisages construction of about 1.42 crore rain water harvesting and artificial recharge structures in the Country to harness 185 BCM of water, by harnessing surplus monsoon runoff to augment Ground water resources."

6.14 When asked, how the Master Plan 2020 differs from the Master Plan 2013, DoWR, RD & GR, in their post evidence submission, stated as under:

> *"The difference in the Master Plan 2013 & Master Plan 2020 are enumerated below:*
>
> ▪ *The revision is a joint effort of State agencies and CGWB and the revised document has been prepared with more scientific understanding/analysis after taking requisite inputs from the States/UTs.*
> ▪ *A general Guideline has been included in the Master plan to develop and apply methods to assess impacts of recharge structures on water availability and quality, social and economic resilience and local ecosystems, for formulating artificial recharge schemes in the State.*
> ▪ *Rainwater Harvesting has been given a thrust in the revised plan and even urban areas have been given necessary consideration."*

6.15 When asked, so far, how many States have implemented the Master plan, 2013, DoWR, RD & GR, in their written reply, stated as below:

> *"Master Plan has been circulated to all the States and UTs as well as to Public representatives (MPs). As a perspective plan, area requiring Artificial Recharge and type and number of structures, based on Hydrogeology and source water availability have been recommended in Master Plan.*
>
> *In order to understand the follow-up action taken by States on the Master Plan, a study on a sample district in each State was taken up. The analysis of the data indicate that the Master Plan has been referred by the States but additional new areas have also been considered as most of the artificial recharge and water conservation works are being taken up under MGNREGS whose main aim is to provide employment under the scheme."*

6.16 The construction of water harvesting and conservation works are also supported through MGNREGS and PMKSY-WDC. Works related to rainwater harvesting structures such as percolation tank and well recharge are permissible under MGNREGS and are executed in the rural areas.

6.17 The Ministry of Rural Development in consultation and agreement with the DoWR, RD & GR and the Ministry of Agriculture & Farmers' Welfare has developed an actionable framework for NRM, titled "Mission Water Conservation" to ensure gainful utilization of funds. The Framework strives to ensure synergies in MGNREGS, PMKSY, IWMP and CAD&WM, given their common objectives. Types of common works undertaken under these programmes/schemes are water conservation and management, water harvesting, soil and moisture conservation, Ground water

recharge, flood protection and development, Command Area Development & Watershed Management.

D. Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC)

6.18 The Ministry of Rural Development, Department of Land Resources has created/rejuvenated various water harvesting structures in different States under PMKSY-WDC component.

6.19 When asked about the measures taken for proper upkeep and maintenance of the various water harvesting structures, the Ministry of Rural Development, stated as under:

> *"In accordance with the para No 9.6 of Common Guidelines for Watershed Development Projects - 2008 (Revised in 2011) homogeneous groups of people likely to derive direct benefit from a particular watershed work or activity including those having land holdings within the watershed areas are constituted into User Groups by the WC. The User Groups have been envisaged to be responsible for the operation and maintenance of all the assets created under the project in close collaboration with the Gram Panchayat and the Gram Sabha. They are responsible for maintenance of Asset Register under Watershed Development Projects and put in place mechanism through WC for collecting user charges which is then credited into the WDF. This fund is used for the maintenance of assets created during the implementation of project on the community land or for the common use.*
>
> *In addition to the user charges, following beneficiary contributions are also credited into the WDF account:*
>
> *a) 10% of the cost of NRM works executed on private land only (5% of the cost of NRM in case of SC/ST, small & marginal farmers).*
> *b) 20% of the cost in the cost intensive farming systems activities / interventions on private lands only (10% of the activity cost for SC/ST beneficiaries).*
>
> *After completion of the Works Phase, at least 50% of the WDF funds shall be reserved for maintenance of assets created on community land or for common use under the project. Works taken up on private land shall not be eligible for repair / maintenance out of this fund."*

6.20 Regarding artificial recharge projects in urban areas, MoHUA informed that the number of structures proposed for urban areas, which are mainly Roof Top Rainwater Harvesting Structures, amount to 106.14 lakh for an estimated cost of Rs 36,794.23 crore. Implementation has been proposed to be through existing schemes such as AMRUT and Smart Cities Mission etc. only and no separate scheme/fund has been envisaged for implementation.

6.21 MoHUA, in their background note also stated that the following strategies have been adopted to facilitate Ground water recharge in urban areas:

"An integrated approach is required for Ground water conservation, which involves managing freshwater, wastewater and storm water. The strategies which are adopted to manage/conserve Ground water are:

(i) Utilization of waste water after tertiary treatment so that treated waste water could be dual source of water supply to bulk water users.
(ii) Proper management of Surface water through rejuvenation and recharge of water bodies and preventing Surface and Ground water from contamination, so as to reduce over dependence on Ground water.
(iii) Recharging Ground water and Surface water though rainwater harvesting and channelling storm water through drains to retention basins.
(iv) Comprehensive water flow auditing from intake to consumer which will assist in identifying old water distribution and house connection pipes that needs repair or replacement on priority basis to prevent conveyance loss.
(v) Water pricing at domestic level to make wiser use of the resource.
(vi) IEC activities to create awareness among masses towards the need for conservation of fresh water.
(vii) Regulating Ground water use and taking other policy measures.
(viii) Follow up a proper monitoring protocol for surveillance of water quality within water distribution network."

6.22 When asked how many storm water drainages have been created/under development in Metro cities like Delhi, Chennai, Mumbai, Hyderabad, Patna and other cities which suffer from frequent floods during rainy season and how many of these are functional/likely to be made functional, MoHUA, in their post evidence reply, stated as under:

"Under AMRUT scheme, 9 States/ UTs have taken up 773 storm water drainage projects worth ₹2,845 crore in 101 cities to address the problem of flooding. Of which 498 projects worth ₹738 crore have been completed and 492 water logging points have already been eliminated from these projects. In addition, 275 projects worth ₹2,107 crore are in progress which are likely to eliminate 274 water logging points upon completion. Among the cities mentioned in this point, Storm water drainage projects have been taken up in Delhi (South Delhi Municipal Corporation) and Patna only. The projects are likely to be completed by February, 2022."

E. Ground water conservation through rejuvenation of water bodies

6.23 One of the strategy adopted for Ground water conservation is proper management of Surface water through rejuvenation and recharge of water bodies and preventing Surface and Ground water from contamination, so as to reduce over

dependence on Ground water. However, water bodies in both urban and rural areas are in dire strait due to negligence and lack of proper maintenance.

6.24 Measures for improvement and restoration of water bodies are being undertaken under the Repair, Renovation and Restoration (RRR) of Water Bodies Scheme component of PMKSY to revive irrigation potential, enhance the tank storage capacity, Ground water recharge, increased availability of drinking water, improvement of catchment of tank commands, etc. It covers rural water bodies having minimum water spread area of 5.0 hectare and urban water bodies having water spread area from 2.0 hectare to 10.0 hectare.

6.25 Renovation of traditional water bodies and creation/ rejuvenation of water harvesting structures are also being undertaken by the Ministry of Rural Development through MGNREGA. Out of 262 permissible works under the MGNREGA Scheme, 85 are water related. Apart from that many watershed related works are also taken up under the Scheme. These works directly or indirectly support water conservation and Ground water recharge.

6.26 It has been mandated in the Act that at least 60% of the works to be taken up in a district in terms of cost shall be for creation of productive assets directly linked to agriculture and allied activities through development of land, water and trees.

6.27 An advisory has been issued to all States/UTs to spend at least 65% of the expenditure in Mission Water Conservation (MWC) Blocks on NRM related works/activities.

6.28 A joint advisory of Department of Rural Development, DoWR, RD & GR, Department of Land Resources 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.

6.29 Under GIS based Planning under MGNREGA, the data from satellites is harnessed for formulating plans for the rural poor. The satellite data accurately

captures the topography of the region and presents an image on which optimal planning of resources can be carried out including water conservation and water harvesting works.

6.30 When asked that whether geo-tagging of the assets created for water conservation/ storage under MGNREGA scheme has been done, the Ministry of Rural Development, in their post evidence submission, stated as under:

"All assets created under Mahatma Gandhi NREGS are invariably geo-tagged along with 2 photographs each in Geo Mahatma Gandhi NREGA. These also include water conservation works/ structures/ assets created under Mahatma Gandhi NREGS. As on date, around 4.22 Cr. assets created under Mahatma Gandhi NREGS are geo-tagged.

Also, Geo Mahatma Gandhi NREGA Phase II has been implemented under Mahatma Gandhi NREGS in all States/UTs on 1st November 2017, i.e. the works under Mahatma Gandhi NREGA are now geo-tagged along with 2 photographs each in three stages: (i) Before start of the work (ii) During the work, (iii) On completion of the work.

The Geo-tagged data under Mahatma Gandhi NREGS is available on Bhuvan Portal of National Remote Sensing Centre (NRSC), ISRO in Public Domain. As, on 7th January 2021, 1.08 Cr. water conservation works/ structured assets are geo-tagged under Mahatma Gandhi NREGA.

Geo-tagging of assets helped in monitoring in the following ways:-

a. *Quick and easy Asset Identification: The valuable asset information provided on Geo MGNREGA is available in public domain. It provides the exact location of the asset, along with 2 photograph and other important details like date of completion, no. of person days, expenditure incurred etc.*
b. *Deter threats: With each asset being created under Mahatma Gandhi NREGA, it is given a unique Asset ID that accounts for permanency. Geo-tagging of these assets provides for exact location. It has become easy for any State/UT to ensure that these assets are not accounted multiple times and also that these are not booked under any other programmes. Therefore, Geo MGNREGA provide evidence for asset tampering.*
c. *Monitoring through JANMANREGA Mobile App: The Ministry launched 'Janmanrega' - a Citizen-Centric Mobile Application (CCMA) on 19th June 2017. The application allows locating already geo-tagged Mahatma Gandhi NREGS assets under Geo Mahatma Gandhi NREGA along with their attributes and two photographs using an android mobile phone. Citizens/Officials can use it to locate the assets in field. JANMANREGA Mobile App provides provision for capturing feedback on such assets.*
d. *Maintain Compliance with the Social Audit: The asset location and information in Geo Mahatma Gandhi NRGEA is a potent tool for social*

audit. Not only it improves the compliance, it also helps in ensuring transparency and accountability.

e. *Coordinated Joint Use among Multiple Departments: A lot of Mahatma Gandhi NREGA works are undertaken jointly with other Ministries and Departments under convergence mode. Not only does Geo Mahatma Gandhi NREGA allow stoppage of double booking and creation of ghost assets but it helps other departments / Ministries to plan accordingly. Further, the asset information is freely available for public over NRSC's Bhuvan Web Portal and thus can be used to interpolate various layers of information."*

6.31 In reply to a query on total number of water bodies, revived in major cities such as Mumbai, Chennai, Bengaluru, Delhi, etc. which have been suffering from acute shortage of water due to floods and drought owing to encroachments in catchment areas of the water bodies, the MoHUA, in their post evidence written submission, stated as under:

"A total of 63 water bodies have been taken up for rejuvenation by States under AMRUT scheme. Of these, 16 water bodies have been rejuvenated so far. Cities in which water body rejuvenation has been taken up under AMRUT are: Gaya, Shimla, Ranchi, Adityapur, Chas, Giridih, Dhanbad, Hazaribagh, Guruvayur, Kollam, Darjeeling, Bongaon and Bhatpara.

Rejuvenation of waterbodies have also been taken up under SCM scheme of the Ministry and currently 151 projects on rejuvenation of lakes, ponds, river fronts etc have been taken up, of which 44 projects have been completed. Cities in which rejuvenation of waterbodies have been taken up under SCM are: Tirupati. Amaravati, Pasighat, Guwahati, Bhagalpur, Patna, Muzaffarpur, Raipur, Bilaspur, Silvasa, Vadodara, Ahmedabad, Rajkot, Faridabad, Karnal, Srinagar, Jammu, Ranchi, Belagavi, Tumkuru, Shivamogga, Davanagere, Hubballi- Dharwad, Mangluru, Jabalpur, Indore, Bhopal, Gwalior, Satna, Sagar, Solapur, Nashik, Thane, Pune, Kalyan Dombivali, Imphal, Shillong, Bhubaneswar, Rourkela, Jaipur, Udaipur, Ajmer, Coimbatore, Madurai, Salem, Tirunveli, Vellore, Tiruchirappalli, Tiruppur, Greater Warangal, Karimnagar, Agartala, Lucknow, Kanpur and Bareilly."

6.32 Asked further about the total number of water bodies that are yet to be taken up for rejuvenation and by what time work on these will be completed, the MoHUA, in their post evidence written submission, stated as under:

"There is no new proposal at present to take waterbodies rejuvenation project. In the proposed Jal Jeevan Mission (Urban) [JJM(U)] of Ministry of Housing and Urban Affairs, which will cover all the 4,378 statutory towns of the country, projects on rejuvenation of waterbodies will be taken."

6.33 When asked about the primary agency responsible for proper maintenance and upkeep of water bodies in urban areas and success achieved along with

required measures to redress the problems, the MoHUA, stated following in their post evidence written submission:

> *"The primary agency responsible for proper maintenance and upkeep of water bodies in urban areas/cities are the State Water Resources Departments and the respective Urban Local Bodies (ULBs). ULBs lack in proper maintenance and upkeep due to financial constraints at State level and at city level. Therefore, ULBs may be financially supported for specific task of upkeep and maintenance of water bodies falling in their jurisdiction."*

Chapter -VII

Regulation of Ground Water Resource

A. Statutory framework

7.1 As per Entry 17 of List II (State List) of Schedule VII to the Constitution of India, Water is a State subject. However, as per Entry 56 of List I (Union List) of Schedule VII to the Constitution, the Union Government can intervene, when considered necessary in the public interest, in respect of issues relating to inter-State rivers and river valleys. Water being a State subject, steps for augmentation, conservation and efficient management to ensure sustainability of water resources are undertaken by the respective State Governments. Central Government provides Central Assistance to the State Governments through various schemes/programmes.

B. Model Bill for Ground water development and regulation

7.2 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 groundwater. In view of the changing ground water scenario, the Department constituted a committee for re-drafting the Model Bill viz. Ground Water (SustainableManagement) Bill, 2017. As of December 2019, the Model Bill was under review as per the suggestions of NITI Aayog.

7.3 As per the CAG Report no. 9 of March, 2021(para no. 2.6 and 2.7), as of December 2019, 19 States / UTs had enacted legislation for management of groundwater. In four of these States, the legislation was only partially implemented; in six other States, enactment of the ground water legislation was pending for various reasons. The remaining States/UTs had not taken action t o enact legislation for ground water. The lack of clear guidelines from the Department impacted the legislations implemented by the States. When asked about the measures taken by the Department for implementation of Model Bill based Ground Water legislation in various States, the Department, in their post evidence reply, stated as under:

> *"Model bill for Ground water legislation has been put up on the Web site of the Ministry of Jal Shakti and also circulated to all States/ UTs to facilitate them to enact Ground water legislations. Time to time, States/UTs are being reminded in this direction."*

7.4 In reply to a specific query on steps taken by the DoWR, RD & GR to persuade other States to enact model legislation, including any meeting/consultation held in this regard and their outcome, the DoWR, RD & GR, in their post evidence reply, stated as under:

"The States/UTs are being advised from time to time to enact Ground water legislations in similar lines to the Ground water Model bill circulated to them for sustainability of precious Ground water resources. Further, the States have been advised to work towards improving water use efficiency, awareness generation, formulating water pricing policies, creating separate Nodal Department etc. in the past. A few of the letters have also been sent in this regard from Secretary to States/UTs."

C. Amendment to India Easement Act, 1882

7.5 The Committee have been informed that Ground water needs to be managed as community resource. However, Section 7(g) of the Indian Easements Act, 1882 states that every owner of land has the right to collect and dispose within his/her own limit all water under the land and on their surface which does not pass in a defined channel. The legal consequence of this law is that the owner of the land can dig wells in his land and extract water based on availability and his discretion. Additionally, landowners are not legally liable for any damage caused to the water resources as a result of over extraction. The lack of regulation for over-extraction of this resource further worsens the situation and has made the private ownership of Ground water common in most urban and rural areas. The CGWB identifies over-exploited and critical areas within States. However, the Board does not have the power to stop Ground water extraction in such area and can only notify the owners. It also links the rights to Ground water and land ownership and excludes the vast number of landless people from a direct stake in the resource. Therefore, there appears a need to change the concerned section of The Indian Easements Act, 1882 by enabling treatment of Ground water as a common pool resource. The matter is under consideration with the Ministry for sending it to Ministry of Law & Justice for suitably amending the clause in consultation with other stake-holders.

7.6 The Standing Committee on Water Resources (2017-18) in their 23rd Report (16 LS) had recommended that it is high time that *'the India Easement Act, 1882' which provides for right to extract Ground Water, be amended at the earliest in view of the present and future scenario to meet the expected increase in the demand of water* which was accepted by the Government. This issue was again highlighted by

the Committee in their 15th Report (17 LS) during the examination of Demands for Grants. However, as stated above, the matter is still under consideration of the Ministry.

D. Regulatory Agencies

(i) Central Ground water Board (CGWB)

7.7 The CGWB was established in 1970 by renaming the Exploratory Tube wells Organization under the Ministry of Agriculture, Government of India. It was merged with the Ground water Wing of the Geological Survey of India during 1972. At present, it is a subordinate office of the Ministry of Jal Shakti, Government of India. CGWB is the National Apex Agency entrusted with the responsibilities of providing scientific inputs for management, exploration, monitoring, assessment, augmentation and regulation of Ground water resources of the country. Major functions of the Board include:

i) Aquifer Mapping.
ii) Monitoring of Ground water levels.
iii) Monitoring of Ground water quality.
iv) Demonstrative projects on aquifer rejuvenation.
v) Assessment of Ground water Resources.
vi) Ground water Exploration.
vii) Research, Training and Awareness programmes.
viii) Technical support to Atal Bhujal Yojana and PMKSY-HKKP-GW schemes, etc.

7.8 When asked if CGWB is adequately equipped with modern technology and capability to develop and manage Ground water resources and measures taken/proposed for technological upgradation of CGWB, DoWR, RD &GR, in their written submission stated as under:

"Central Ground water Board over the years has created adequate infrastructure in terms of drilling machinery and scientific equipment for carrying out studies related to Ground water exploration, monitoring, assessment and management. The Board has a fleet of drilling rigs equipped for Ground water exploration in different types of terrains. Required infrastructure for carrying out field activities like monitoring, survey and mapping are available with the Board and are regularly upgraded. For assessment of chemical quality, CGWB has 16 well-equipped chemical laboratories of which 09 are NABL accredited.

To make most of the infrastructure and expertise available in other academic and research institutes in the country, CGWB also collaborates with organizations like CSIR-NGRI, GSI, NIH, BARC, IIT/IISc etc.

To keep pace with the technological advancements, CGWB regularly assess their requirements for new equipment and constantly make endeavours to procure new equipment and impart trainings on new equipment to the officers concerned. In order to impart exposure to CGWB Scientists so as to keep them abreast of the modern tools and techniques and to get acquainted with international practices, the officers are also sent for training to reputed international training Institutes."

7.9 When asked that whether the CGWB is well equipped to collect data on pollution/contamination of Ground water from different sources, DoWR, RD &GR, in their written submission stated as under:

"Regional labs of CGWB are well equipped to collect data on pollution/contamination (geogenic) of Ground water from different sources. However, deployment of manpower needs to be strengthened in few labs which is being taken up appropriately."

(ii) Central Ground Water Authority (CGWA)

7.10 Central Ground water Board (CGWB) was constituted as an Authority *vide* Ministry of Environment and Forests Notification S.O. 38 (E) dated 14 Jan 1997 under Section 3 (3) of Environment (Protection) Act, 1986 on the judgment of Hon'ble Supreme Court of India in IA No. 32 in W.P. (C) No. 4677 of 1985 dated 10 Dec 1996 to regulate and control Ground water management and development.

7.11 When queried about the distinct role played by the CGWB and the CGWA, in management of Ground water resource, the DoWR, RD & GR, in their written submission, stated as under:

"CGWB

Mandate:

To Develop and disseminate technologies, monitor and implement national policies for the Scientific and Sustainable development and management of India's Ground water Resources, including their exploration, assessment, conservation, augmentation, protection from pollution and distribution, based on principles of economic and ecological efficiency and equity.

Activities:

CGWB being the national apex organization is vested with the responsibilities to carry out scientific studies, exploration aided by drilling, monitoring of Ground water regime, assessment, augmentation, management and regulation of country's Ground water resources.

CGWA

Central Ground water Authority has been constituted under Section 3 (3) of the Environment (Protection) Act, 1986 to regulate and control development and management of Ground water resources in the country

Powers & Functions:

The Authority has been conferred with the following powers:

i. *Exercise of powers under Section 5 of the Environment (Protection) Act, 1986 for issuing directions and taking such measures in respect of all the matters referred to in Sub-Section(2) of Section 3 of the said Act.*
ii. *To resort to penal provisions contained in Sections 15 to 21 of the said Act.*
iii. *To regulate and control, management and development of Ground water in the country and to issue necessary regulatory directions for the purpose.*
iv. *Exercise of powers under Section 4 of the Environment (Protection) Act, 1986 for the appointment of officers."*

7.12 On the issue of optimum availability of manpower (technical and non-technical) in the CGWB, the DoWR, RD & GR during the examination of Demands for Grants 2021-22 had informed that there was an issue of shortage in both scientific and engineering categories and to fulfill the immediate requirement of CGWB, the young professionals and consultants are engaged on a contractual basis. Technical staffs (Scientific and Engineering) are not being deputed for administrative work. When asked about the handling of work of both CGWB and the CGWA for unhindered execution of mandated functions, the Department, in their written replies, stated as under:

"The technical manpower available in Regional Offices of CGWB are being entrusted with additional workload of CGWA. The restructuring of CGWA is in advance stage in the Ministry. To improve the functioning of CGWA, they are hiring young professionals also."

7.13 The Standing Committee on Water Resources in their 16th Report (16 LS) recommended the complete separation of CGWB and CGWA with clear demarcation of their activities to enable them to function in an independent manner. However, the Ministry informed that a proposal for delinking the CGWA from CGWB and creating a separate organization with adequate manpower is under active consideration in the Ministry.

7.14 When asked, whether any time line has been fixed for separating the two agencies, as the matter has been pending for a very long period and is necessary for better management and regulation of Ground water resource, the DoWR, RD & GR, in their written reply, stated as under:

"It is kindly submitted that it is difficult to fix any timelines in this regard as creation of a new organization requires decision/approval at various level, however, the matter is being expedited."

7.15 Queried further about appropriate measures required for better management and conservation of Ground water, the DoWR, RD & GR, in their written submission, stated as under:

"The following points may be considered to usher in better Ground water governance:

- *Strengthening of State Ground water Departments.*
- *Participatory Ground water Management with Panchayati Raj Institution given due weightage in Ground water management.*
- *Conjunctive use of Ground water and Surface water & increasing water use efficiency.*
- *Appropriate Ground water regulation with participation of all stake holders.*
- *States/UTs may review their free/subsidized electricity policy to farmers, bringing suitable water pricing policy and may work towards crop rotation/diversification etc."*

7.16 Asked further to elaborate the problems being faced by the DoWR, RD &GR in conserving the Ground water resources in the country, the Department, in their written reply stated as under:

"Water being a State subject, initiatives on water management including conservation of Ground water in the Country is primarily States' responsibility. In order to facilitate State Governments, the Central Government generally formulates various policy framework, guidelines, and manuals etc., which are circulated to all States and UTs for their consideration/implementation. The Central Government also shares the findings of various technical studies, pilot studies of CGWB etc with the State/UT Governments in order to enable them to replicate the same at State level in suitable hydrogeological conditions. However, State Ground water Departments in certain States need to be adequately strengthened for effective implementation of various Ground water management interventions.

Further, for effective implementation of Ground water management measures, stakeholder's/community participation is necessary. Therefore, the Ground water schemes being implemented by the various States should aim at more and more people's participation for effective result."

Chapter VIII

Community participation and role of Civil society organisations in Ground Water management

8.1 Various NGOs/VOs/RWAs and individuals have undertaken/implemented 'Best Practices' to promote water conservation and Ground water replenishment in the country. Some of them are listed as under:

- Bundelkhand Jal Saheli Manch (Water Friends) at Chhatarpur, Bundelkhand - They have built check dams with government allocations and 'shramdan' or voluntary contributions by the community. The 'panchayat' considers the village Water Security Plan (WSP) or, the 'Jal Suraksha Karya Yojana' prepared by them before any major decisions on water conservation works is taken.
- Apna Talab Abhiyan is a Water Management through Farm Pond (Khet Talab) - Mainly implemented across Mahoba District, U.P. by Apna Talab Abhiyan Samiti. Apna Talab Abhiyan was started during drought year 2013 from district Mahoba. Farmers constructed around 1100 farm ponds in which about 20 lakh cubic meter water was stored.
- The Water Cup by Paani Foundation which motivates villagers to conserve and harvest water through a contest in Maharashtra. The Foundation organized the first Satyamev Jayate Water Cup competition in 2016. The idea was tested in 03 Talukas, with 116 villages in their first year. Subsequently, the competition expanded to include several Talukas and thousands of villages in the State in the next two years. The foundation began modestly by selecting only 3 Tehsils for the mission, but has been scaled up to as many as 4,032 villages spread over 75 drought-hit Tehsils in four regions of Maharashtra— Marathwada, Vidarbha, North Maharashtra, and Western Maharashtra in 2018. In 2016 and 2017, the participating villages created an aggregate storage capacity of 10,000 crore litres of water.
- Watershed Development Programme at Hiware Bazar Tal- Ahmednagar, District - Ahmednagar Maharashtra – Under active involvement of Mr. Popatrao Pawar, Yeshwant Watershed Development Trust Govt of Maharashtra has constructed Continuous contour trench (CCT), Deep CCT, Earthen Structures, Percolation Tank, CNB Works, Widening and deepening of Nalla Bed, Cement Storage Tank, Compartment bunding, Plantation etc.

(under Employment Guarantee Scheme, Ideal Village scheme of State Govt.) which has resulted in the rise of water table in the village.

- Neeru Aarogyam (Water - Health) – This pertains to "Gravity Fed Water Supply Systems" (GFWSS) at Vishakapatnam, Andhra Pradesh by Visakha Jilla Nava Nirmana Samithi (VJNNS), Narsipatnam. It is a spring harvesting project and supply of safe & protected, filtered drinking water to the hill top and remote & interior areas of tribal regions is being ensured.
- Participatory Ground water management at Kummaravandla Pally village of Anantapur district of Andhra Pradesh by Farmers Community. 25 nos of farmers of Kummaravandla Pally have formed a collective Kolagunti Ummadi Neeti Yajamanya Sangham to “share Ground water with each other” to sustain their crops with the help of government bodies and NGO WASSAN.
- Rainwater harvesting and management of water in steep slopes for cultivation at Along (Aalo) district headquarter of West Siang District, Arunachal Pradesh by local Farmers which involves traditional methods of terrace cultivation in high slope of Arunachal Himalayas which will help in water conservation & their impounding at various levels for cultivation of paddy.
- Rainwater harvesting and management of water for dual fish-cum-paddy cultivation at Lower Subansiri district (Ziro valley), Arunachal Pradesh by local farmers which involves traditional structures for conservation of water for fish-cum-paddy cultivation which will help in Impounding water at various levels for paddy & fish cultivation and their release to lower level.
- Rooftop rainwater harvesting at Kabirdham District in Chhattisgarh by NGO called “Samerth Charitable Trust”. Repair and revival of water structure and construction of Rain Roof Water Harvesting Structures has been undertaken in Government Primary Schools in Chhattisgarh.
- Revival of water supply system at Pipaliya(V), Surendranagar district in Gujarat by NGO called “Aga Khan Rural Support Programme (India)”. Existing water supply system was revived with the committee taking up major responsibility at village level right from project planning, site selection, contribution collection, material procurement, distribution and logistics. Due to which the village people having access to safe drinking water and villages like Karan received a Clean Village award.
- Roof rainwater harvesting and storage at Patan, Surendranagar, Kutch areas

in Gujarat by Self Employed Women Association (NGO). About 4000 individual tanks were constructed to store rain water among which many were shared tanks. The women setup local water committees to take up reclaimation and revival of traditional water bodies with almost two lakh families in more than 500 villages led by women 'water managers'.

- Rainwater harvesting at Mewat district in Haryana by community. At the Government School, Untka village, Ground water is not potable. Hence, the roof water harvesting system was established to recharge aquifer with rainwater. With the financial support from the Department of Science and Technology (Government of India), the RWH unit was set up for a roof area of 638 square metres to capture rainwater. Due to which the school is having potable recharged water for drinking.
- Bhungroo – Ground water Injection Well in Gujarat. 'Bhungroo' is a water management system that injects and stores excess rainfall water in underground aquifers. This water is thereafter used for irrigation purposes during summers. The intervention was carried out at sites identified by the Gram Panchayat through resistivity surveys by the Ground water Department and Geologists from DWMA (District Water Management Agency). Design and estimation was done under MGNREGS. The pilot project was carried out in Gujarat with user groups. The steps such as installation of one unit with sub-surface storages at three levels between 25 to 110 feet with a total capacity of 2 crore litres was implemented. The farmers were trained in installation of Bhungroos. Installation of piezometer was done for water level monitoring on a day-to- day basis.

8.2 When asked about the steps taken by the DoWR, RD & GR to replicate the above said good management practices in Ground water management in the rest of the country, the Department, in their post evidence reply, stated as under:

"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 inter-connective link on best practices has also been created for receiving inputs from public, which, after necessary evaluation/validation, shall be put on the website.

The best practices of State Government (http://mowr.gov.in/government-initiatives), NGOs (http://mowr.gov.in/ngo-initiatives) & Corporates (http://mowr.gov.in/private-corporate-initiatives) have been uploaded in the website of the Ministry for wider publicity. CGWB organized Bhujal Manthan in 2017 at Nagpur, in which participants from representatives from Panchayat,

NGOs, progressive farmers, officers from State & Central Government participated and best practices of NGOs, State Government, etc. were deliberated and showcased for knowledge transfer.

National Awards have been instituted by the Ministry towards the best practices of water conservation in the category of State, District, Village Panchayat, Urban Local Body, Media print (Print & Electronic), School, Institution/RWA/Religious Organization for campus usage, Industry, NGO, Water User Association & Industry for CSR Activities to promote/motivate various institutions in the countries towards the goal of water conservation.

Best practices leading to sustainable water management implemented / developed by the participating States of Atal Bhujal Yojana shall also be compiled for circulation to various stakeholders/users."

8.3 Further queried about awareness programmes initiated by the DoWR, RD & GR to sensitise people about importance of judicious use of Ground water, the Department, in their written replies, stated as under:

"Department of Water Resources, RD & GR is successfully broadcasting Radio Story Telling episodes–Paani Ki Chitthi, each of 15 minutes duration on FM Channels to create awareness about water conservation/harvesting. From time to time, Radio Jingles/spots on water conservation are also broadcasted across the country on Radio FM.

Further, various Awareness programmes on Ground water issues initiated/conducted by CGWB are listed below:

- *Workshops on community participation in Ground water management is being carried out by CGWB in 11 States.*
- *61 numbers of awareness programmes on 'Water Conservation' have been conducted throughout the country by CGWB.*
- *Ministry has launched **"Water Heroes-Share your Stories"** contest for promoting value of water and supporting countrywide efforts on water conservation and sustainable development of water resources. Persons who have dedicated their efforts and contributed significantly in the field of water conservation, water resource development and management are being felicitated by the Ministry.*
- *National Water Awards have been launched with an objective to encourage all stakeholders including the Non-Governmental Organizations (NGOs), Gram Panchayats, Urban Local Bodies, Water User Associations, Institutions, Corporate Sector, Individuals etc. for adopting innovative practices of Ground water augmentation by rainwater harvesting and artificial recharge, promoting water use efficiency, recycling & re-use of water and creating awareness through people's participation in targeted areas."*

8.4 When asked about the role played by Resident Welfare Associations (RWAs) in cities and metros to prevent over-exploitation of Ground water and promote judicious use of water and how effectively they can be roped in to address

the problem of acute water shortage in cities, the DoWR, RD & GR, in their post evidence submission stated as under:

> *"During recent years, in the metropolis and cities the RWAs have taken a quantum leap in preventing Ground water decline by adopting RWH systems in their respective societies. Several RWAs in the country have made significant achievements in the area of rainwater harvesting (RWH) as well as water conservation by implementing a systematic plan of providing the RWH ptheir as well as by sensitizing the residents through various awareness programmes. RWAs have also taken initiatives on sensitizing residents on the need to conserve water through awareness programmes and distribution of pamphlets giving simple tips to conserve water at domestic level and societal levels."*

8.5 In response to another query about steps taken by the DoWR, RD & GR to engage NGOs/VOs in their efforts to incentivize judicious use of Groundwater and reduce over-exploitation of Ground water in areas, where it has been depleted to alarming levels, the Department, in their post evidence reply, stated as under:

> *"Atal Bhujal Yojana (ATAL JAL) is a Central Sector Scheme of the Government of India having an outlay of Rs 6000 Crores, with focus on community participation and demand side interventions for sustainable Ground water management in identified water stressed areas in seven States namely - Gujarat, Maharashtra, Karnataka, Rajasthan, Haryana, Uttar Pradesh and Madhya Pradesh.*
>
> *The objectives of the scheme include inculcation of behavioral changes among the grassroot level stakeholders to facilitate judicious use of Ground water. Training and capacity building activities have a vital role to play in ensuring success of the scheme.*
>
> *The Scheme has provisions that allow the States to engage DIPs, consisting of one or more NGOs/Community Based Organisations who shall facilitate hand-holding of the ground level stakeholders in various aspects of the scheme. In addition, reputed NGOs with field experience in participatory Ground water management shall also be involved in training and capacity building activities to be taken up under the scheme."*

PART II

OBSERVATIONS / RECOMMENDATIONS

Ground water, a diminishing resource

1. Ground Water resources of India has become an important source for catering to drinking water and irrigation needs of the country, with 80 percent of rural drinking water, 50 per cent of urban drinking water and 2/3rd of irrigation water being met from Ground water. The Committee observe that despite being endowed with sufficient Surface water sources, the growing dependence on Ground water is due to its decentralized availability, increasing demands for fresh water, vagaries of rainfall, increased population, industrialization and urbanization, etc. resulting in severe depletion in Ground water levels. The Committee note that as per the 2020 assessment, out of the total annual extractable Ground water resource of 398 Billion Cubic Metre (BCM), 245 BCM of Ground water is being extracted in the country and the stage of Ground water development which is a measure of annual Ground water extraction for all uses over annual extractable Ground water resource, in the country is 61.6 per cent. They observe that out of the total 6965 assessment units (Block/ Taluks/ Mandals/ Watersheds/ Firkas) in the country, 1114 units have been categorized as 'Over-exploited' while 270 units have been categorized as 'Critical' and 1057 units as 'Semi- critical'. They further observe that more assessment units have reported deterioration in Chattisgarh, Gujarat, Haryana, Madhya Pradesh and Rajasthan in 2020 assessment as compared to those improved. Although a marginal improvement in overall Ground water situation in 2020 assessment as against in 2017 has shown a ray of hope, the Committee still believe that concerted actions are needed for conservation and judicious use of Ground water. The Committee find that the Central Water Commission, in their June 2019 report

stated that availability of free power supply has resulted in the excess drawal of Ground water through more than 20 million pumps and is getting wasted. Continued extraction has resulted in further deepening of water levels as reflected in the comparison of depth to water level of Pre-monsoon 2020 with mean of last 10 years (2010-2019) wherein 37 per cent of the observation wells registered a decline of Ground water table by 0-2 metres. A decline of more than 4 metres was observed in 10 per cent of the wells in Andhra Pradesh, Chandigarh, Delhi, Haryana, Punjab, and Rajasthan and in isolated pockets of most of the other States/ UTs except Arunachal Pradesh, Bihar, Daman & Diu, Himachal Pradesh, Jharkhand, Meghalaya, Nagaland and Tripura. Depth to water level in the country ranged between less than 2 to more than 40 metres Below Ground Level during the pre-monsoon period of 2020 with major parts of North-Western and Western States having water level in the range of 10 to 40 metre Below Ground Level. This calls for a relook at the policy measures being adopted for Ground water management in both deficient and surplus areas for their balanced and judicious use in order to fulfill various water demands of the country in most harmonious way. The Committee are of the opinion that management of Ground water resources should be given topmost priority in areas where the underground water reserves are seriously threatened while at the same time ensuring judicious use of Ground water resources in areas where there is significant reserve, as a complement to Surface water.

Need for holistic and centralized management of Ground water

2. The Committee find that regional distribution of Ground water is also varied, with Northern mountainous terrain of Himalaya (from Kashmir to Arunachal Pradesh) being major source of recharge for the vast Indo-Gangetic and Brahmaputra alluvial plains. The States of Uttar Pradesh, Bihar, Assam and West Bengal falling in this region has sub optimal Ground water development except in Haryana and Punjab. They observe that Peninsular Shield located south of Indo-Gangetic-Brahmaputra plains has limited Ground water potential while coastal tracts have potential multi-aquifer systems in the States of Gujarat, Kerala, Tamil Nadu, Andhra Pradesh and Orissa. However, inherent quality problems and the risk of seawater ingress impose severe constraints in Ground water development from these aquifers. The Committee observe that a number of measures such as Atal Bhujal Yojana, water harvesting and conservation works under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC) have been taken by the Central Government. The problem of Ground water contamination is being handled by Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB). Various initiatives have also been taken at the State level such as 'Mukhyamantri Jal Swavlamban Abhiyan' in Rajasthan, 'Jalyukt Shibar' in Maharashtra, 'Sujalam Sufalam Abhiyan' in Gujarat, 'Mission Kakatiya' in Telangana, and 'Neeru Chettu' in Andhra Pradesh to enable judicious use and conservation of Ground water. However, the actual results, till now, both in terms of regulating quantity and quality of Ground water have shown only marginal improvement since Ground water governance is widely scattered with Center, State, local bodies and civil groups, all having their role in it. The Committee

find that the regulatory role is strewn over the domain of many Ministries and State Governments making implementation of corrective steps/measures a tedious process. The Committee are of the opinion that water resource management being their primary jurisdiction, the Ministry of Jal Shakti should play a bigger role in coordinated implementation of programmes for Ground water conservation by way of not only providing inputs and suggesting appropriate measures but also monitoring their status and outcome. Keeping in view the diverse Ground water situation across the length and breadth of the country, the Committee are of the view that instead of standalone approach, scattered over the jurisdiction of multifarious agencies/departments under the administrative control of a number of Ministries, for addressing each dimension of the problem of diminishing reserves of Ground water and deterioration in their quality, focus should shift towards their holistic management by a Centralised body/agency under the aegis of the Ministry of Jal Shakti, since this is the nodal Ministry assigned with the responsibility to manage the overall water resources of the country. Formation of such an agency would, on the one hand, help deal with the issues with unified approach along with the responsibility for lapses and on the other hand, enable taking of required timely measures to reddress the situation. They, therefore, recommend the Ministry of Jal Shakti to accordingly form a body with inter-ministerial representation as well as representation from State Government Departments, which would be entrusted with the responsibility to regulate Ground water in a cohesive and holistic manner.

(Recommendation Sl. No. 1)

Real time monitoring of Ground water resource

3. The Committee note that at present manual monitoring of Ground water level is done four times a year and water quality samples are collected once a year to obtain background information of Ground water quality change on regional scale. They further note that Ground water monitoring networks are being enhanced by Central and State implementing agencies across the country for improving real time monitoring of Ground water, for which Digital Water Level Recorder (DWLR) along with GPRS/GSM based Telemetry system are being installed at representative piezometer locations across the country under National Hydrology Project (NHP) to enable collection of data on six hourly basis, with transmission once a day. However, the installation of DWLR is expected to be completed by March, 2024. The Committee are of the view that though the current estimates of Ground water has enabled us to give a picture of overall situation in the country, it is, at times, not clearly representative of actual condition, since Ground water regime shows wide variation depending upon the type of aquifers and specific local conditions. Therefore, collection of data and dissemination on real time basis will greatly help in formulation of appropriate strategy and adoption of measures by both the Government and user communities, suitable to the local requirements. The Committee, would therefore, recommend the Department to upgrade the required number of piezometers with latest technology and equipments and ensure simultaneous availability of real time data in public domain at the earliest.

(Recommendation Sl. No. 2)

Depleting Ground water in Urban areas – Monitoring of land use pattern in cities

4. The Committee note with utmost concern the findings of the pre monsoon 2020 analysis of 923 wells in 51 urban areas of the country showing dip in water level by more than 40 metres in 61 wells (7%), water level in the depth range of 20-40 m Below Ground Level (BGL) in 159 wells (17%) and water level in the depth range of 10-20 m BGL in 208 wells (23%). They further note that water level in major cities such as Delhi, Kolkata, Hyderabad, Ahmedabad, Gwalior, Ludhiana, Amritsar, Faridabad, Chandigarh, Coimbatore, Vijaywada, Vishakhapatnam, Vadodara, Jaipur, Jodhpur, Allahabad, Ghaziabad, Kanpur, Agra, Lucknow, Meerut, Varanasi and Dehradun has gone down by more than 20 metres BGL. As per the submission of the Ministry of Housing and Urban Affairs, reasons for the sharp drop in water level in the above cities are increasing population, urbanization, concretization (preventing water seepage in the ground and causing floods during rainy season) and lack of Surface water sources for drinking purposes. Increasing reliance on Ground water to meet water needs of the cities was reported by CGWB in the Report of the Ground Water Resource Estimation Committee, 2015 according to which 50% of urban water usage was sourced from Ground water. Use of Ground water has increased further in recent years as cities like Ludhiana, Amritsar and Faridabad are totally dependent on Ground water with 100 per cent of their water supply being met from Ground water sources. Cities like Ghaziabad and Dehradun are also on the verge of becoming totally Ground water dependent as 71% and 80% of their respective water needs are being met from Ground water. As brought out further in the recent assessment held in 2020, out of 67 urban assessment units, change has been observed only in 34 assessment units of

Delhi where number of Over Exploited category assessment units has come down from 20 to 17 while showing an increase of 5 assessment units in Critical category. In this regard, the Committee find that in spite of well established fact that changing land use pattern in cities and metros with increasing concretization has reduced potential to recharge Ground water and pose serious threat of floods during rainy season, so far no study has been conducted/initiated by either the MoHUA or CGWB regarding the extent of change in land use in cities and their repercussion on water balance. Since encroachment of river beds and catchment areas of water bodies in cities is a big threat to sustainable water management, the Committee recommend the Ministry of Jal Shakti to study this aspect and devise suitable measures with penal provisions in consultation with State Governments and MoHUA to prevent further encroachments. The Committee believe that a Central body, entrusted with Ground water management and governance, as recommended by them, can very effectively ensure regular monitoring so that local water bodies are preserved and Surface and Ground water resources are used harmoniously to meet growing water needs of expanding cities. The Committee would like to be apprised of the action taken in this regard within three months of presentation of this Report.

(Recommendation Sl. No. 3)

Early implementation of Projects under Atal Mission for Rejuvenation and Urban Transformation (AMRUT)

5. The Committee appreciate that several measures with desirable objectives have been taken by the MoHUA to reduce dependence on Ground water in urban areas. However, in their view, implementation mechanism needs to be refurbished for achievement of desirable goals. They find that

Atal Mission for Rejuvenation and Urban Transformation (AMRUT), launched in 2015 in 500 selected cities across the country envisaged development of basic urban infrastructure in the sectors of Water Supply; Sewerage & Septage Management; Storm Water Drainage; Non-Motorised Public Transport and Permeable Green Spaces & Parks. However, the Mission is yet to complete and grounded projects are likely to be implemented by March 2023. Principal reasons for delay in accomplishment of Mission objectives are stated to be due to long gestation nature of water supply projects, monsoons and floods, delay in getting required clearances from other departments such as NHAI and Railways and national and local lockdowns imposed due to COVID-19 pandemic. Since, in view of the Committee, since majority of projects are still under implementation stage, no visible impact could be seen in water management in cities. From the submissions of the MoHUA, the Committee notice that besides 500 cities covered under AMRUT, there are other 3,878 ULBs approximately, which are in dire need of similar programme and are being covered under SBM(U). The Committee would therefore emphasise early implementation of water sector projects under AMRUT to realize the potential goal of judicious use of water in the cities and effective management of Ground water. They would further like to be apprised of the details of physical and financial progress of projects sanctioned under both AMRUT and SBM(U) along with targeted dates of their completion.

(Recommendation Sl. No. 4)

Need for effective strategies to deal with the climate change implications on water balance

6. The Committee observe that changing global climate with rise in temperature has serious implications on water availability due to associated spurt in natural calamities such as floods and droughts. Combined with rising population and urbanization, extreme climate events have already started having serious repercussion on water balance in the form of excessive rainfall within a short span of time causing floods and increasing runoff without enough water getting seeped into the ground causing fall in the water table beneath ground. Long spells of summer with rising temperature, on the other hand, leaves the land parched without enough water storage in the face of disappearing water bodies due to human encroachments. Another big threat looming large is the problem of melting Himalayan glaciers causing havoc in the form of heavy floods and landslides. In the face of such challenges, the Committee are apprehensive that the measures taken so far to deal with this problem may not be adequate. They find that it took almost 9 years for the Ministry to set up full fledged National Water Mission in 2020, which is still not well equipped with adequate funds and autonomy. The Mission still needs expertise as consultants and advisors are yet to be appointed in the NWM. Further, adequate studies are required to be undertaken to assess the impact of climate change on the total water availability to enable formulation of appropriate policies to handle their effects. The Committee would, therefore, recommend the Government to give required financial powers and autonomy to the Mission to enable it to fulfill their objective under National Action Plan on Climate Change. They also desire that NWM should be entrusted with the task of taking all the Ministries/Departments, State Governments on board for devising strategies

for water management in a cohesive manner. They also recommend the Department to initiate a study to evaluate the role of climate change in aggravating the water scarcity and required changes in strategies to reduce their effects.

(Recommendation Sl. No. 5)

Excessive use of Ground water in irrigation

7. The Committee notice that over extraction of Ground water for meeting irrigation needs is prevalent mainly in Northern States, particularly in Punjab, Haryana and Rajasthan which are extracting 97%, 90% and 86% of Ground water respectively for this purpose. Other States such as Karnataka, Tamil Nadu and Uttar Pradesh are also significant users of Ground water for irrigation as they are using approximately 89%, 92% and 90% respectively of their total Ground water extraction for agricultural purposes. They further note that percentage share of Ground water extraction for irrigation with respect to total Ground water extraction for all uses in 11 major States of Punjab, Haryana, Uttar Pradesh, Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Tamil Nadu, Karnataka, Andhra Pradesh and Telengana varies between 80% to 90% or more than 90%. Main reason for such over exploitation of Ground water is due to wide cultivation of water guzzler paddy and sugarcane crops which are heavily incentivized by way of highly subsidized pricing of water, power, fertilizers on one hand and assured markets for their outputs through procurement of rice in Punjab-Haryana belt and of sugarcane by sugar factories at Government determined prices. However, this has aggravated the problem and encouraged inefficient agricultural practices with low water use efficiency in rice cultivation which is 1000 mm to 1200 mm in India as against 550 mm to 650 mm in Asia where

China, India, Indonesia, Bangladesh and Vietnam are major producers. Similarly in case of Sugarcane, it is 1800 mm to 2400 mm in India *vis a vis* 1059 mm to 1640 mm in Brazil which is a major producer of sugarcane crop. While there is an urgent need to address the overuse of Ground water in agriculture, the Committee find that prevalence of a large number of Ground water abstraction structures of around 20.46 million in agriculture of which 87.86% of wells (as per minor irrigation census of 2013-14) are owned by marginal, small and semi-medium farmers, primarily growing food for their own sustenance, gives little scope for outright stopping of Ground water use in agriculture. However, they note that in accordance with CGWA Guidelines, Punjab and Haryana have come up with innovative schemes such as 'Pani Bachao Paisa Kamao' and 'Jal Hi Jeevan/Mera Pani Meri Virasat' etc. respectively to motivate farmers towards water conservation. The Committee further notice that DA&FW has taken a litany of measures to reduce Ground water consumption in agriculture, such as:

(a) PMKSY-Per Drop More Crop (PDMC),

(b) Mission for Integrated Development of Horticulture (MIDH),

(c) Cultivation of pulses and coarse cereals under National Food Security Mission (NFSM) and oilseeds under National Mission on Oilseeds and Oil Palm (NMOOP),

(d) latest crop production and protection techniques like System of Rice Intensification (SRI), Direct Seeded Rice (DSR), line Transplanting, stress/drought tolerant/ climate resilient varieties, bio-fortified varieties,

(e) Integrated Nutrient Management (INM),

(f) Integrated Pest Management (IPM) techniques,

(g) Crop Diversification Programme (CDP) is being implemented in original Green Revolution States of Punjab, Haryana and Western Uttar Pradesh to diversify cropping pattern away from water guzzling paddy.

However, the progress made in terms of bringing down the Ground water use is minimal. While accepting Ministry's submission that participation, involving consultations with farmers and other stakeholders through a bottom up approach instead of 'Command and Control Strategy' will be a better strategy in dealing with the problem of Ground water depletion in agriculture, the Committee do not concur with the Ministry's contention that it is only the responsibility of concerned State Departments (Agriculture/ Irrigation/ Water Resources) to undertake suitable demand and supply side measures to ensure sustainability of Ground water sources. Keeping in view the pivotal role of the Central Ministry and the need for a congruent approach in policy measures, the Committee recommend that a Central body (with representation from concerned Ministries and State Governements), as recommended by them earlier, should be entrusted with the responsibility to implement measures in a cohesive manner to wean away farmers from water intensive crops in areas with severe Ground water shortage and incentivize them in areas which have enough Ground water recharge with adequate annual replenishment to ensure sustainable use of Ground water. Further mass sensitisation at local level needs to be encouraged to ensure active community participation in decision making process at each level for better implementation of agricultural practices in accordance with water conservation measures. The Committee therefore, recommend, devising integrated measures for adoption in agriculture, to reduce dependence on Ground water in agriculture.

(Recommendation Sl. No. 6)

Need for shift in focus from 'land productivity' to 'water productivity'

8. The Committee find that while there is an acceptance for the need to reduce water consumption in agriculture by discouraging unsuitable crops and change in cropping pattern, the commitment towards the same goal is yet not firm as reflected by continued cultivation of water intensive crops in water scarce areas. Therefore, they are of the view that there is an urgent need for a shift in policy stance encompassing changes, ranging from suitable cropping pattern, restricting free electricity, modification of incentive structure for crop production, spreading awareness among farmers to reduce use of Ground water in irrigation and subsidizing micro irrigation methods etc. to realize the objective of judicious use of water resource which is becoming scarce day by day. The Committee, would therefore, recommend the Ministry of Jal Shakti to work out a policy to ensure judicious water use not only to reduce dependence on Ground water but to reduce its footprint in agriculture. In this regard, the Committee would like to emphasise that in addition to land productivity, water productivity i.e. production per cubic meter of water should be a major criteria in decisions relating to crop production. They therefore recommend the DoWR, RD & GR to engage with the DA&FW and emphasise this point to enable formulation of appropriate policy decisions relating to crop production in the country.

(Recommendation Sl. No. 7)

Water use efficiency in agriculture – Funding pattern under PMKSY-Per Drop More Crop (PDMC)

9. **The Committee note that micro irrigation is being promoted by the Department of Agriculture & Farmers' Welfare through their PMKSY-Per Drop More Crop (PDMC) scheme, using Drip and Sprinkler Irrigation system. The scheme also supports micro level water storage or water conservation/management activities to supplement Micro Irrigation. The Committee note that financial assistance under PMKSY-Per Drop More Crop (PDMC) is being provided by the Centre on 60: 40 basis to States based on their demand, submitted through States' Annual Action Plans (AAP) except the States in the North Eastern parts and Himalayan States, in whose case the funding pattern is 90:10 while it is 100% in case of Union Territories. However, in view of the Committee, this has created contradiction since States such as Punjab and Haryana which have severe Ground water crisis have been allocated meager amount of funds for implementing micro irrigation system. Since funding pattern for micro irrigation should be on the basis of water deficiency in the area rather than on the basis of principles of Centrally Sponsored Schemes, the Committee are of the considered view that more Central assistance should be given for micro irrigation in those areas which are water starved and have Ground water depletion. The logic of North Eastern States requiring more Central support (90:10) due to topographical and socio-economic conditions which hampers utilization of full potential of the rain fall and Ground water resource and hence requiring micro irrigation for increasing the water use efficiency at farm level to enhance the production & productivity of the crops and increase the income of the farmers does not hold good in case of assistance for micro irrigation as these States have abundant water supply and actual problem is to harness it so as**

to reduce the flood menace. The Committee therefore think that the existing policy of giving more financial assistance to such States appears to be in contradiction with the objectives. They, therefore, recommend the Ministry of Jal Shakti to take up this matter with the Ministry of Finance in consultation with the DA&FW and impress upon the need to change the funding pattern in the ratio of 90:10 for States suffering from water shortage and 60: 40 for water abundant States. Although the allocation under the scheme is based on the principle of inclusivity and are released on the basis of demand, the Committee are of the view that the Department of Agriculture & Farmers' Welfare has to play a more proactive role. The DoWR, RD & GR should impress upon the Department of Agriculture & Farmers' Welfare to strive to release funds under the scheme to those States which cultivate water intensive crops but have not been actively implementing micro irrigation methods, the need for utilizing funds under PDMC on the basis of approved AAP and clear previous unspent balances, so as to reduce dependence on Ground water.

(Recommendation Sl. No. 8)

Opening the market for supply of drip irrigation machinery and need for further reduction in GST

10. The Committee notice that small and marginal farmers face a lot of problems such as need for high initial investment, lack of water storage, pumps and pipes, lack of awareness of the benefit and incentives of the micro-irrigation system, quality and after sales service of equipment, etc. in respect of installation of Drip and Sprinkler Irrigation system. The DA&FW has taken several initiatives to address these problems which include:

(i) **Financial assistance @ 55% for small and marginal farmers and @ 45% for other farmers for installation of Drip and Sprinkler Irrigation systems**

(ii) **25% higher unit cost have been taken into calculation of subsidy for the North Eastern and Himalayan States and 15% higher for States with low penetration of Micro Irrigation for larger adoption of systems by the farmers**

(iii) **Setting up of a dedicated Micro Irrigation Fund (MIF) with NABARD with objective to facilitate the States in mobilising the resources**

(iv) **Micro level water storage or water conservation/management activities under PDMC scheme to ensure water supply**

(v) **Publicity campaigns through press, print and digital media, publication of leaflets/booklets, organization of workshops, exhibitions, farmer fairs, information on State/Government of India web portals**

(vi) **Imparting of training to farmers by ICAR**

(vii) **Supply of only BIS marked systems/components with free after sales service to the beneficiary for a period of at least three years from the date of installation of the system with provision of penalty including de- registration with the approval of SLSC are provided.**

Further the Committee note that GST rate on Micro irrigation equipments currently stands at 12%. While applauding the steps taken by the DA&FW to incentivize micro irrigation techniques, the Committee feel that existing system of supply of drip irrigation equipments by only registered companies have limited the access to good quality equipments, thereby discouraging farmers to adopt drip irrigation. They are of the opinion that micro irrigation techniques can be widely practiced if all companies engaged in manufacturing drip irrigation equipments are made eligible and given subsidy to supply equipments, as it would infuse competitive spirit and encourage supply of better equipments to farmers. They, therefore, recommend the DoWR, RD & GR to impress upon the Department of Agriculture & Farmers' Welfare, the need for opening the market for supply of subsidized micro irrigation equipments in order to propagate micro irrigation techniques which would help save water. Further, they would also urge the Department to take

up the matter of further reducing GST levels on drip and sprinkler equipments with the Ministry of Agriculture & Farmers' Welfare as a further incentive to increase micro irrigation.

(Recommendation Sl. No. 9)

Power supply in agriculture

11. The Committee note that as per the provisions of Electricity Act 2003, respective State Electricity Regulatory Commissions (SERCs) determine the electricity tariff for retail supply of electricity to end consumers including Agricultural consumers. Section 65 of the Electricity Act, 2003 provides that State Government can provide subsidy to any class of consumers in the tariff determined by the SERCs. States like Punjab, Haryana, Telangana and Tamil Nadu offer completely free power, while other States have provision for collection of token charges. They further observe that while accepting the fact that subsidized electricity provided by State Governments has led to the over-extraction of Ground water as farmers use it extensively to run pumps that draw up Ground water and restricting free electricity to the farmers will certainly reduce the misuse of Ground water, both the DoWR, RD & GR and DA &FW have expressed inability to persuade States to reduce/stop subsidy for power given in agriculture as Electricity is a concurrent subject and SERCs determine the electricity tariff for retail supply of electricity to end consumers under the extant provisions of Electricity Act, 2003. The Committee however note that Punjab introduced a scheme by way of which farmers were refunded money if they consumed less electricity. They further note that under Deendayal Upadhyay Gram Jyoti Yojana of Ministry of Power, separate component of agriculture and non-agriculture feeders have been created for facilitating judicious rostering of supply to agriculture & non-

agriculture consumers in rural areas. However Ground water continues to be used excessively for catering to irrigation demands. Therefore, the Committee are of the view that use of electric pumps need to be further discouraged by way of devising such measures as introduction of pre-paid cards for power supply, restricting it for a few hours in the day, etc. They, therefore, recommend DoWR, RD & GR to take initiative by urging both the Ministry of Power and DA & FW along with State Governments to take steps on the suggested lines and apprise them about the details of action taken in this regard.

(Recommendation Sl. No. 10)

Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM)

12. The Committee note that with a view to increase farmers' income, provide them with reliable source for irrigation and de-dieselise the farm sector, Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM-KUSUM) Scheme was launched. However, solar pumps under the scheme are preferably being provided in areas where micro irrigation is practiced. While encouraging solar pumps for micro irrigation in water scarce areas will help economic use of water, the Committee think that this policy may not be appropriate for areas with high water table since installation of solar pumps will facilitate extraction of water and use for cultivation of water intensive crops, which would, in turn, help in mitigating the intensity of floods. Therefore, in their view, the existing policy of encouraging installation of solar pumps only in areas practicing micro irrigation needs to be redesigned to promote use of solar pumps for drawal of water in water surplus areas as well without necessarily linking it to installation of micro irrigation methods. The Committee, therefore, recommend the DoWR, RD & GR to impress upon

the need for revisiting the policy in this respect in consultation with the DA & FW and the Ministry of New and Renewable Energy and incentivize micro irrigation only in water stressed areas and delink use of solar pumps. They would like to be apprised of the action taken in this regard.

(Recommendation Sl. No. 11)

Need for encouraging cultivation of crops in accordance with existing climatic conditions

13. The Committee observe the NABARD's finding that growing paddy and sugarcane is still preferred in States with Ground water scarcity which consumes 60 per cent of irrigation water in the country since these are lucrative crops due to high Minimum Support Price given by the Government. The policy of encouraging production of these crops till now, though, assured food security post Green Revolution, caused serious depletion of Ground water reserve as it continued despite fulfillment of objectives of Green Revolution. Now, the grim water situation in the States of Punjab, Haryana and Western Uttar Pradesh has urgently necessitated shifting of crops from high water intensive crops to low water intensive crops. Though several steps such as introduction of Direct Seeded Rice (DSR) and System of Rice Intensification (SRI) for judicious use of water in paddy cultivation, alternative crops demonstrations in an area of 5,01,257 hectare over the years from 2013-14 to 2019-20 and adoption of schemes like *Mera Pani Meri Virasat* in Haryana, etc. have been taken to diversify crop production and cultivation of alternative crops with low water intake, farmers are yet to be properly discouraged from growing these crops as they continue to enjoy high MSP on these crops. The Committee would, therefore recommend the DoWR, RD & GR to engage more actively with the DA&FW and State Governments for

taking appropriate steps for growing less water consuming crops especially in the Northern States where depleting Ground water has assumed alarming proportions.

(Recommendation Sl. No. 12)

<u>Ground water use in industries</u>

14. The Committee notice that CGWA grants NOC/renews NOC for Ground water withdrawal for commercial purposes, after ensuring that recharge is done as per the quantity of Ground water drawn and stage of their development. Further, as per the direction of Hon'ble NGT *vide OA no. 176/2015* dated 11.09.2019, any industry drawing Ground water illegally is liable to pay Environmental Compensation to the respective State Pollution Control Boards. Also, CGWA, in their latest Guidelines issued in September 2020, has fixed Environmental compensation for Ground water withdrawal by industries, infrastructure units and mining projects without a valid NOC from appropriate authority. Environmental Compensation Rate (ECR_{GW}) has been based on the approved norms prescribed by CPCB. In addition, deterrent factor has also been introduced to compensate for the losses and environmental damages, based on the duration of illegal Ground water extraction. However, the Committee are surprised to note that a large number of industries are operating without taking the NOCs due to a lack of mandatory linkage between the SPCBs/PCCs and CGWA, as pointed out by CAG. They further notice that though CGWA had imposed penalty of Rs. one lakh/industry under Section 15 of the Environment (Protection) Act 1986 for non-compliance of NOC conditions on 20 Industries, only 5 industries/companies have paid Environmental Compensation to CGWA/District Magistrate. Also, no compensation has been paid to

CPCB/SPCBs as directed by NGT in their 11.9.2019 order. They also find that out of the 21 packaged drinking water units, located in 6 States, which were studied by CPCB, only 4 have obtained NOC from CGWA for abstraction of Ground water resources for manufacturing package drinking water. Further, only 10 out of 21 units have obtained Consent under Water (Prevention and Control of Pollution) Act, 1974 from respective State Pollution Control Boards. While the regulations are in place to ensure that Ground water is not extracted without adequate measures for recharge, the lack of effective implementation and supervision has made the regulations toothless. The Committee are, therefore, of the view that to stop unrestricted use of Ground water for commercial uses, strict enforcement of the Regulations/Guidelines is required along with stringent vigil and appropriate penalties. They, therefore, recommend the CGWA and CPCB to work in unison so that projects using Ground water are issued Consent to establish and Consent to operate only after NOC is issued by CGWA. Further, vigilance capacity and inspections should be enhanced to ensure compliance with stipulated provisions which can act as an effective deterrent against misuse of Ground water. Keeping in view the fact that recycle and reuse of water is an essential aspect in bringing down the water use, the Committee would like to be apprised of the details of total quantity of recycled/reused water used by different categories of industries in the country along with total number of industries flouting these norms and measures taken to remedy the situation.

(Recommendation Sl. No. 13)

Collection of data on Ground water pollution and contamination

15. The Committee notice that Ground water contamination occurs through both natural and anthropogenic sources. Contamination through various sources such as salinity, fluoride, nitrate, arsenic, iron, etc. have been reported from a large number of partly affected districts in Assam, Bihar, Karanataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Tamil Nadu, Odisha and Uttar Pradesh with other remaining States also having a few affected districts. Central Ground Water Board (CGWB) is monitoring Ground water levels through a network of 22,730 observation wells, four times a year and the information is disseminated to the concerned State agencies in the form of reports and maps. Ground water quality is also monitored by CGWB at regional level once every year through their network of about 15000 observation wells located all over the country. Further Ground water management studies, Ground water exploration, Industrial/ pollution cluster studies, etc. is also undertaken to find out the extent of contamination. However, they note that CPCB along with SPCBs and PCCs, also monitors Ground water quality at 1231 locations throughout the country under National Water Quality Monitoring Programme (NWMP) except Andaman & Nicobar Islands, Arunachal Pradesh and Sikkim on a half yearly frequency. Under NWMP, Ground water quality monitoring stations are selected considering the criteria such as Drinking water sources located in sanitary conditions and prone to sewage contamination, preferably in shallow aquifer in the vicinity of septic tanks; sewage treatment plant; oxidation pond, cess pools, garbage dump sites, tube-wells, hand pumps or dug-wells located in industrial areas prone to contamination and are in use as well as Ground water sources in residential areas. The Committee are not able to comprehend the rationale for

involving two agencies, entrusted with the same task of monitoring contamination in Ground water. Since Ground water is basically under the domain of CGWB with CGWA being regulatory authority, monitoring and data collection on its quality should primarily be dealt with by CGWB which could be shared with CPCB to enable adoption of suitable remedial measures. They would, therefore, recommend the Department to appropriately address the issue and take measures for convergence of activities relating to better management of Ground water under the aegis of a single, Centralised body/Agency.

(Recommendation Sl. No. 14)

Early Implementation of water supply schemes in areas affected with Ground water contamination

16. They further note that many cities and metros such as Agartala, Ahmedabad, Bhubaneshwar, Guwahati, Hyderabad, Jaipur, Delhi, Lucknow, Nagpur, Patna, Ranchi, Shillong, Srinagar, etc. have reported high amount of geogenic contamination while Ahmedabad, Bengaluru, Chennai, Lucknow, Nagpur, Delhi, Dehradun, Guwahati, Hyderabad, Jaipur, Kolkata, Patna, Panaji, Pondicherry and Trivandrum suffer from anthropogenic contamination of Ground water. Having noted that contamination problem is almost everywhere in the country with as many as 249 districts in 18 States affected with high salinity problem, 370 districts in 23 States having Fluoride contamination beyond permissible limit, 423 districts in 23 States suffering from Nitrate , 152 districts in 21 States having Arsenic problem, 341 districts in 27 States having Iron in excess quantity, 92 districts in 14 States having Lead, 24 districts in 9 States having Cadmium and 29 districts in 10 States reporting Chromium in their Ground water, the Committee believe that

measures taken by the Government so far have not been able to produce desired results. The anthropogenic causes, such as excessive use of fertilizers and pesticides and emission of effluents from industries have contributed in aggravating the problem to a large extent. Punjab has got the sobriquet of 'Cancer capital of India' due to excessive use of chemical fertilizer and pesticides. The Committee, particularly note the high level of uranium found in few pockets of Rajasthan and Bihar where Ground water is used for drinking purposes. They observe that under Jal Jeevan Mission (JJM) 10 percent weightage has been given to the population residing in habitations affected by chemical contaminants while allocating the funds to States/UTs. Keeping in view the widespread problem of Ground water contamination in the country which is an important source of drinking water and thus posing health hazard, the Committee desire that alternative arrangements should be made to provide safe drinking water in areas affected with contamination. The Committee recommend the CGWB to urge both the Department of Drinking water and Sanitation and State Governments to take urgent steps for utilising funds under JJM in all the areas affected with chemical/metals/ions/radioactive elements/organic contaminants. They would like to be apprised of the details of such areas, (State wise) and allocation of funds under JJM in such areas along with the water supply schemes implemented /proposed to be implemented for provision of safe drinking water.

(Recommendation Sl. No. 15)

Ground Water pollution by industries – Need for a unified approach

17. The Committee note that CGWB has found contaminated Ground water in most of the 88 industrial clusters identified by CPCB. Further, 38 industrial clusters have been identified by CPCB as Critically Polluted Areas (CPAs) with Comprehensive Environmental Pollution Index (CEPI), [which is a rational number (ranging from 0 to 100) to characterize environmental quality at a given industrial areas following algorithm of pollution source, pathway and receptor], score of 70 and above and 31 industrial clusters have been identified as Severely Polluted Areas (SPAs) in the CPCB's assessment of CEPI scores in 2018 at 100 identified industrial clusters (including 88 industrial clusters above) in 21 States across the country. They are particularly concerned to note that out of 72,314 industries requiring Effluent Treatment Plants (ETPs), only 70,555 industries have functional ETPs, of which 1040 industries do not comply with environmental standards. The Committee observe that CPCB has taken following measures for preventing industrial pollution of Ground water :

- **(i) Industry Specific Standards and General Standards for discharge of effluents notified under the Environment (Protection) Act, 1986,**
- **(ii) Time-Targeted Action Programme under Corporate Responsibility on Environment Protection (CREP),**
- **(iii) Establishment of Common Effluent Treatment Plants (CETPs) for cluster of Small Scale Industries,**
- **(iv) Installation of Online Continuous Effluent / Emission Monitoring System (OCEMS) with real time data connectivity to CPCB, and**
- **(v) Zero Liquid Discharge (ZLD) to protect the water quality in view of lean flow situation in rivers and streams in a larger non monsoon period.**

However, they note that little progress seems to be made in reducing Ground water pollution, a fact, admitted by the CPCB itself attributing it to unabated growth of population and resultant waste water generation along

with uncontrolled abstraction of Surface and Ground water causing reduction in recharge potential. In this regard they note the submission made by the MoEF &CC that (i) absence of a policy on water pollution, (ii) preponderance of State Government agencies in implementation of policy as Water is a State subject, (iii) difficulty in implementation of policy due to sharing of aquifers by a number of States and (iv) involvement of multiple agencies at Central and State level has further compounded the problem. Further, Lack of proper monitoring of NOC conditions while permitting abstraction of Ground water under The Water (Prevention and Control of Pollution) Act, 1974, no data on water consumption by the municipalities, local bodies and industrial units post repeal of Water Cess Act, etc. reflect the dire state of affairs in policy implementation regarding Ground water. The Committee are therefore of the opinion that water being most important resource for survival of life, its governance cannot be left scattered over multiple jurisdictions. Further, there is an imperative need for chalking out a Scheme/Programme specifically to control Ground water pollution. Therefore, in addition to the need for urgent measures for setting up a nodal agency/Centralised body, the Committee further recommend that immediate steps should be taken to formulate programme to prevent Ground water pollution. Besides, monitoring of compliance by the industries needs to be done scrupulously to reduce violations. Also, quarterly physical inspections of all the functional ETPs are prerequisite to ensure that untreated water is not discharged. Accordingly, the Committee recommend the Department to take appropriate measures and apprise them about their details within three months of presentation of this Report.

(Recommendation Sl. No. 16)

Amendment to the Water Pollution and Prevention Act, 1974 empowering SPCBs for imposition of penalties

18. The Committee note that Grossly Polluting Industries on the main stem of Ganga and Yamuna are being monitored through Third Party verification since 2017 and violators are being issued closure orders by SPCBs and also levied environmental compensation. The Committee further note that CPCB is mainly concerned with framing of Guidelines without any role in their enforcement as most of these powers are vested with the SPCBs under the Water Pollution and Prevention Act, 1974 except the authority to impose fines, for which Courts have to be approached. Therefore, direction for closure is more convenient option for SPCBs to enforce violators to abide by the Guidelines. Admitting the existing gap in enforcement powers, the Secretary, MoEF & CC informed that the Act will be amended to bridge the gap. While agreeing to the need for enforcement of the environmental norms/standards for ensuring industrial development in a sustainable way, the Committee, however, do not approve of closure notices as a widely used option. Since industrial development is also a necessity for employment generation and prosperity, the Committee are of the considered view that a balanced approach needs to be adopted. While strict penalties need to be imposed for flouting environmental norms, direction for closure should be resorted to as a last option. Further, there should be a mechanism to check that the 'Consent of establishment and Consent to operate' granted to industries, are in accordance with the norms fixed and in case of any change/revision in existing norms, after Consent to establish is issued, closure notices on grounds of non compliance with changed norms should be avoided. The Committee desire that such cases should be studied and appropriate time frame should be fixed to ensure compliance with the new

norms. Also, the SPCBs need to be vested with power to impose monetary penalties to help them take appropriate action for minor violations without straightaway going for closing the violating industrial unit. They, therefore, recommend the DoWR, RD & GR to urge the MoEF & CC to bring the necessary amendments to Water Pollution and Prevention Act, 1974 urgently to sufficiently empower SPCBs to impose fines for violations of minor nature.

(Recommendation Sl. No. 17)

Real time monitoring of effluent discharge by industries

19. The Committee observe that CPCB has directed all the 17 category of highly polluting industries to install Online Continuous Effluent / Emission Monitoring System (OCEMS) with real time data connectivity to CPCB which conducts regular inspection and takes action on exceedance alerts of OCEMS or offline OCEMS. Although industry Specific Standards and General Standards for discharge of effluents have been notified under the Environment (Protection) Rules, 1986, the Committee observe that MoJS also, is in the process of finalizing policy by bringing out standards/limit for treated or used water to utilize/recycle in various sectors including agriculture wherein use of untreated water for irrigation purposes has emerged as a big issue, especially in cities posing health risk for city dwellers. Further, they observe that CPCB is monitoring ETPs regarding discharge of treated water on the basis of computer generated SMS alerts received on violation of effluent and emission standards and recorded in OCEMS. Having noted that despite all the above measures, industrial pollution of Ground water remains a burning problem, the Committee are of the view that stricter vigil of ETPs is required to ensure that untreated water does not get discharged in any way into water bodies, especially by the industries operating on the banks of

rivers and canals. In their view, besides inspection of industries, study of water quality of rivers and canals having industries on their banks should also be conducted to find out how effectively the Effluent Treatment Plants are working. They, therefore, recommend the DoWR, RD & GR to conduct such a study in coordination with CPCBs and SPCBs and furnish the details of number of industries situated on the banks of rivers, number of such industries with functional ETPs, volume of water treated by the ETPs before discharge, number of violators and action taken against violators during the last 5 years.

(Recommendation Sl. No. 18)

Strengthening of CPCB and SPCBs

20. The Committee observe that CPCB and SPCBs which were formed with an important mandate of monitoring and controlling water pollution under the Water (Prevention and Control of Pollution) Act, 1974 have inadequate manpower at their disposal to carry out their activities. The need for recruiting 207 more officials in CPCB was recommended by Indian Institute of Public Administration (IIPA) way back in 2016, however, still, the Board is struggling to execute their functions with lesser manpower. They notice that manpower in CPCB has not increased since last two decades despite manifold increase in work load, as submitted by CPCB. Similar situation is noticed in case of SPCBs as well, whereby monitoring activities under National Water Quality Monitoring (NWMP) / State Water Quality Monitoring (SWMP) / Real Time Water Quality Monitoring (RTWQM) and Ground Water (GW) have been outsourced in many States/UTs such as Andaman and Nicobar islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chandigarh, Chattisgarh, Daman & Diu and Dadra & Nagar Haveli, Goa,

Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Lakshadweep, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Puducherry, Punjab, Rajasthan, Sikkim and Tripura. Besides manpower, financial resource crunch is also a major problem faced by CPCB, crippling their power further to implement their programmes. Keeping in view the increasing deterioration of environment in general and water in particular, the Committee recommend that immediate measures be taken to address the shortage of manpower and resource crunch in both CPCB and SPCB. The Ministry of Jal Shakti, being the nodal Ministry for management of water resource, the Committee recommend the Ministry to take initiative and urge the MoEF &CC to take necessary action for strengthening both CPCB and SPCBs at the earliest and furnish the details of measures taken within three months of presentation of this Report.

(Recommendation Sl. No. 19)

National Aquifer Mapping and Management Programme (NAQUIM)

21. The Committee note that under the NAQUIM launched in 2012, CGWB had identified 24.8 lakh sq km area of the Country for aquifer mapping. However, up to December 2020, only 14.78 lakh sq km area was covered under Aquifer Mapping. Remaining area is envisaged to be covered by 2022-23. However, the Committee are apprehensive that the target of covering remaining area of 10.02 lakh sq. km will be accomplished within a span of next few years as the implementation of this programme has been very slow paced since it was launched in the year 2012. Although the factors causing initial delays are stated to have been addressed now successfully, the Committee, taking cognizance of CAG's apprehension too in this regard, concur that the Department should adopt a time bound approach to finish

mapping of aquifers within the targeted period. The Committee would, therefore, recommend the Department to prepare a time bound strategy for completing aquifer mapping by the stipulated period so as to initiate measures for their management at the earliest. They would also like to be apprised of the details of aquifers (which have been mapped so far) showing Ground water depletion and measures taken to arrest the depletion and recharge them, both at the Centre and State level.

(Recommendation Sl. No. 20)

Need for extending the coverage of the Atal Bhujal Yojana (ATAL JAL) Scheme

22. The Committee observe that Atal Bhujal Yojana (ATAL JAL), being implemented from 1.04.2020 for a period of 5 years, is the only scheme of the Government of India which has been launched with a view to augment Ground water by managing their demand side. The Scheme is being implemented on pilot basis in 80 districts of seven States, viz. Haryana, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh with an outlay of Rs 6000 crore. Selection of States was done on the basis of the criticality of Ground water situation, willingness and degree of preparedness. The Committee, however, notice that several States with acute Ground water shortage such as Himachal Pradesh, Punjab, Delhi and Tamil Nadu have not been included in the pilot scheme. They, therefore, desire to be apprised of the reasons for excluding these States where Ground water situation is equally critical. The Committee have been given to understand that the feasibility of up scaling the Scheme to other parts of the Country will be considered only after five years, based on the lessons learnt from implementation of the Scheme and their efficacy/outcome in improving the

long-term sustainability of Ground water resources in the selected 80 districts under the pilot scheme. However, keeping in view the urgency for implementation of such scheme in States having large number of over exploited blocks, the Committee would recommend that Scheme should be extended in all States which are suffering from Ground water scarcity and have substantial number of over exploited and critical blocks.

(Recommendation Sl. No. 21)

Artificial recharge to Ground water

23. The Committee note that to facilitate artificial recharge to Ground water, CGWB prepared Master Plan for artificial Recharge to Ground water in the year 2013 which has been revised in 2020 based on inputs from the State agencies. They are happy to note that States have given due consideration to Master Plan, 2013 besides identifying other areas for artificial recharge under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS). They also observe that artificial recharge to Ground water is supported through MGNREGS and Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (PMKSY-WDC). They find that the Ministry of Rural Development (MoRD) in consultation and agreement with the DoWR, 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 by ensuring synergy in MGNREGS, PMKSY, Integrated Watershed Management Programme (IWMP) and Command Area Development & Water Management (CAD&WM), given their common objectives. They note that as on 30.09.2020, 5,90,638 Water harvesting structures (WHS) were created/rejuvenated under PMKSY-(WDC) during the period from 2015-16 to

2020-21. However they think that instead of construction of new artificial recharge structures, focus should be given on revival of existing village ponds/lakes/water bodies under MGNREGA which will, on the one hand ensure employment and on the other hand ensure maintenance of the WHS created so far with less capital expenditure than needed for constructing new structures. This will also encourage mass participation in upkeep and maintenance of WHS crucial for fast recharge of Ground water. The Committee would, therefore, recommend the DoWR, RD & GR to accordingly advice MoRD for more emphasis on rejuvenation and revival of water harvesting structures under MGNREGA. Further, the Committee recommend that the DoWR, RD & GR should play a more proactive role by ensuring coordination in implementation of programmes and monitor the outcome of works to achieve multiple goals simultaneously and effectively. In this regard, the Committee would like to know the steps taken by the Department for sharing of information available under their National Aquifer Management Programme with District and Block administration entrusted with execution of works under MGNREGA and how effective they have been in facilitating conservation and recharge of Ground water.

(Recommendation Sl. No. 22)

<u>Ground water recharge measures in Urban areas</u>

24. **The Committee note that in Urban areas, Ground water recharge is being taken up mainly through Roof Top Rainwater Harvesting Structures. They note that 106.14 lakh Roof Top Rainwater Harvesting Structures for an estimated cost of Rs 36,794.23 crore is proposed to be implemented through existing schemes only. Further under AMRUT scheme, 9 States/ UTs have**

taken up 773 storm water drainage projects worth ₹2,845 crore in 101 cities to address the problem of flooding, out of which 498 projects worth ₹738 crore have been completed and 492 water logging points have been eliminated from these projects. However among major cities, Storm water drainage projects have been taken up only in Delhi (South Delhi Municipal Corporation) and Patna. While descending Ground water table along with floods and water logging in monsoons have become a recurrent feature in major cities and metros, no significant progress have been noticed in channelizing and harvesting excess rainwater. They are concerned to find that storm water drainage projects are yet to be taken up in metro cities like Mumbai and Chennai where shortage of water supply and water logging in monsoons are a regular feature. Further such projects taken up in cities like Delhi are also under construction stage. Since mere taking up of projects without proper execution and maintenance will not result in actual benefit, the Committee believe that such projects need to be speeded up to actually see their effects transformed into results. In their view, absence of a nodal body at the Central level and lack of a coordinated approach has hindered the fast execution of projects delaying achievement of objectives. They, therefore, recommend the Ministry of Jal Shakti to take urgent steps to dovetail all the measures taken by different agencies/Departments/Ministries to complete the works so as to better manage Ground water and at the same time reducing flood/waterlogging in cities like Mumbai and Chennai as an additional benefit. The Committee would also like to be apprised of the details of the cities where storm water drainage projects have been installed along with the total number of cities where such projects are yet to be taken up and time period by which such projects are likely to be installed in all the metro cities.

(Recommendation Sl. No. 23)

Physical verification of works completed under MGNREGA

25. **The Committee observe that rejuvenation of water bodies (crucial for Ground water recharge and alternative water source) is being done under the Repair, Renovation and Restoration (RRR) of Water Bodies Scheme component of PMKSY, covering rural water bodies having minimum water spread area of 5.0 hectare and urban water bodies having water spread area from 2.0 hectare to 10.0 hectare. Further, water bodies are also being rejuvenated/created by the Ministry of Rural Development through MGNREGA. They notice that all assets, created under Mahatma Gandhi NREGA are being geo-tagged along with 2 photographs each in Geo Mahatma Gandhi NREGA which includes water conservation works/ structures/ assets also. So far, around 4.22 Cr. assets created under Mahatma Gandhi NREGS are geo-tagged. Further, under Geo Mahatma Gandhi NREGA Phase II, launched on 1st November 2017, the works under MGNREGA are now geo-tagged along with 2 photographs each in three stages: (i) Before start of the work (ii) During the work, (iii) On completion of the work. However, keeping in view the instances wherein repetitive works have been undertaken under MGNREGA, the Committee would emphasise physical verification of MGNREGA works by the Central Government officials. They, therefore, recommend the DoWR, RD & GR to impress upon the Ministry of Rural Development, the need for physical inspection of works in the final stage for better upkeep of assets created and judicious use of MGNREGA funds.**

(Recommendation Sl. No. 24)

Rejuvenation of water bodies in urban areas

26. The Committee notice that 63 water bodies in cities have been taken up for rejuvenation under Atal Mission for Rejuvenation and Urban Transformation (AMRUT) and 151 under Smart Cities Mission (SCM), while rest of the water bodies will be taken up under Jal Jeevan Mission (Urban) of the Ministry of Housing and Urban Affairs (MoHUA). However, no specific information has been provided about water bodies in major cities of Delhi, Mumbai, Chennai and Bengaluru where encroachment and pollution of water bodies is a big issue. They further note that in cities and urban areas, Urban Local Bodies (ULBs) are primarily responsible for maintenance of water bodies. However, they are concerned to note that ULBs are unable to ensure proper maintenance of water bodies as these are severely starved of funds both at State and local level. The Committee therefore recommend that the DoWR, RD & GR should urge the MoHUA and State Governments to take steps for strengthening ULBs. They would also like to be apprised of the measures taken in this regard within three months of presentation of this report. Further, they desire that total number of water bodies in urban areas along with the details of the status of encroachment, extinct, etc. along with measures taken/contemplated to restore the water bodies especially in metro cities like Delhi, Chennai, Mumbai, Hyderabad, Kolkata and Bengaluru be furnished to them within three months of presentation of this report.

(Recommendation Sl. No. 25)

Legislation for management of Ground Water

27. The Committee note that a model Bill was circulated to States and Union Territories to enable them to enact suitable law for management of Ground water in 1970 which was subsequently revised in 1992, 1996 and 2005

to give effect to proper regulation of development and management of Ground water. However only 19 States have enacted legislation on Ground water, based on model Bill. Further, the Committee note that CAG, in its report has observed that lack of clear guidelines from the Department impacted the legislations implemented by the States. Taking into account the delay in enacting a law in the States, the Committee are of the view that urgent action need to be taken by States by enacting laws to prevent misuse of Ground water and their extraction beyond recharge. They find that as of December 2019, the Model Bill was under review as per the suggestions of NITI Aayog. Since specific instructions/guidelines need to be spelled out for implementation of Model Bills in States to enable them to enact suitable legislation in accordance with their local requirements, the Committee recommend that urgent action need to be taken by the Department for the same. In this regard, the Committee would like to be apprised of the outcome of the review by NITI Aayog. They would also like to be apprised of the main problems/challenges being faced by the State Governments which are coming in the way of effective management of Ground water and steps taken to address them both at the Central and State levels.

(Recommendation Sl. No. 26)

<u>Amendment to India Easement Act, 1882</u>

28. While there is an urgent need to prevent Ground water depletion to an alarming level, the Committee find that archaic law of 1882 relating to extraction of Ground water by owner of the land is still in place. This aberration was highlighted by the Committee in their 23rd Report (16 LS) and 15th Report (17 LS) and the Department had submitted in their reply that the issue was being referred to the concerned Ministry for appropriate action.

The Committee would, therefore, recommend the Department to take steps to bring amendment to the said Act, so as to make Ground water, a 'community resource'.

(Recommendation Sl. No. 27)

Shortage of manpower at CGWB and CGWA

29. The Committee note the issue of staff crunch at CGWB, which has become more pronounced due to additional burden of carrying out activities of CGWA. The shortage of both technical and non-technical personnel incapacitate CGWB and CGWA in discharging their respective mandates. The Committee would, therefore, recommend taking up urgent measures for filling up the vacancies. They would also recommend filling up of vacancies in CGWA separately to enable it to carry out their regulatory role more effectively.

(Recommendation Sl. No. 28)

Separation of CGWB and CGWA

30. The Committee further note that CGWB has been entrusted with the task of assessment, augmentation, management and regulation of country's Ground water resources by way of scientific studies, exploration aided by drilling and monitoring of Ground water regime while Central Ground Water Authority (CGWA) has been constituted under Section 3 (3) of the Environment (Protection) Act, 1986 to regulate and control development and management of Ground water resources in the country. Thus, development and management of Ground water resources is primarily under the jurisdiction of CGWB whereas CGWA's main role is regulation and control. However, the Committee find that CGWB and CGWA are not functioning as

separate entities and there is no distinct division of mandate with regard to regulation of Ground water. They further find that despite highlighting this fact in the Committee's Report on Demands for Grants in 2017, the issue still lingers on and is yet to be approved by the Competent Authority. Since overlapping of operations cannot do justice in the matters of development of Ground water on the one hand and their control on the other, the Committee recommend the Government to take immediate steps to separate the two with clear jurisdiction and administration to oversee the management of Ground water in a better way.

(Recommendation Sl. No. 29)

Need for strengthening Ground water departments at State level

31. They further find that although policy framework, guidelines and manuals, etc. of the Central Government and the findings of various technical studies and pilot studies of CGWB are circulated to all States and UTs for their consideration/implementation but ineffective/lack of implementation in States/UTs have led to the reckless use of Ground water. In this regard, the Committee's attention has been drawn to the fact that 'Water' being a State subject, initiatives on water management including preventing the misuse/overuse of Ground water in the Country is primarily States' responsibility which has not been very well carried out, due to less effective functioning of Ground water departments in the States. As submitted by the Department itself, strengthening of Ground water departments in the States at various levels appears to be one of the pre-requisites for attaining better regulation and management of Ground water resources. While agreeing that State Governments need to play a decisive role in addressing the problem of severe depletion of Ground water, as the subject of 'Water' primarily falls into

their domain, in view of the Committee, State Governments need to be supported by the Central Government in the endeavour to take appropriate measures for effective monitoring and regulation of Ground water extraction. They would also like to be apprised of the State wise details of manpower available in respective State Ground Water Boards including total number of Staff at various levels, their technical competency, adequacy, etc. and measures taken to address the same within three months of presentation of the Report.

(Recommendation Sl. No. 30)

Role of Communities in sustainable development of Ground water resources

32. As observed in previous paragraphs, management and development of Groundwater in India is at present scattered with many Departments/ Ministries dealing with different aspects of their management. However, the Committee are pleased to note that equally important role is being played by the communities/civil society organisations in both rural and urban areas in saving and conserving this precious resource. The Committee observe that many commendable local efforts have been made by groups/communities to conserve Ground water in various States/Districts and utilize it in self sustainable manner. But as the problem of depletion and contamination of aquifers is spreading almost all over the country, a participatory approach in management of Ground water will go a long way in ensuring their sustainable utilization. While creation of a centralised body/agency in the Ministry of Jal Shakti, as recommended earlier, will help fill the institutional vacuum, close cooperation with the user groups and communities is the key to better management of Ground water. In view of the Committee, participation of user

groups is necessary to make Government's efforts to conserve, augment and manage Ground water resources successful. Further aquifer based management of Ground water is the need of the hour with focus on recycling and reuse of Ground water and participatory recharge and demand-management. The Committee believe that participatory Ground water management should be integrated in agriculture, watershed development and employment generation activities such as MGNREGA to make it successful. Not only conservation efforts but also maintenance and monitoring of water storage structures could be assigned to user groups/ beneficiaries who are best suited to the purpose. Accordingly, Ground water management practices should be adopted as guiding principle for all the works under taken by local administration in both urban and rural areas. The Committee would, therefore, recommend the Department to take appropriate measures in this regard and apprise them of the actions taken within three months of presentation of this Report. They would further recommend the Department to adopt such measures as to replicate the successful models in Ground water management in remaining States/ areas of the country by encouraging the local communities and providing them with institutional support to use best practices for water management on a wider scale.

(Recommendation Sl. No. 31)

NEW DELHI
14 March, 2023
23 Phalguna,1944 (Saka)

Shri Parbatbhai Savabhai Patel
Chairperson,
Standing Committee on Water Resources

Part-III
Annexure

Annexure -I

Compliance Status of all Industries Generating Trade Effluent and Requiring ETPs															
l. No.	**tate/UT**	**otal No. of Industries which require ETPs**	**o. of industries having functional ETPs**	**o. of industries operating without ETPs**	**Action taken against industries operating without ETPs**				**Details of Industries having functional ETPs**		**Action taken against industries having ETPs but Non-complying with the Effluent Standards**				**onth of the Information**
					o. of industries against which show cause notice/ directions issued	**o. of industries against which closure directions issued**	**o. of industries against which legal cases filed**	**o. of industries against which action is under process**	**o. of industries complying with Effluent Standards**	**o. of industries Non-complying with Effluent Standards**	**o. of industries against which show cause notice /directions issued**	**o. of industries against which closure directions issued**	**o. of industries against which legal cases filed**	**o. of industries against which action is under process**	
	I														
	ndaman & Nicobar	2	7						7						an-20
	ndhra Pradesh	091	074	7	7				053	1	1				un-20
	runachal Pradesh														ec-18
	ssam	472	677	95	99	12		4	440	37				34	ay-19
	ihar	19	12						11						ov-20
	handigarh	45	45						45						ec-20
	hhattisgarh	011	05	06		06			05						ec-20
	aman & Diu	5	5						5						ul-20
	adra Nagar Haveli	59	54						43	1	1				ay-19
0	elhi	504	504						504						ug-20
1	oa	09	09						08						ec-20

2	ujarat	2815	2639	76	7	0			2496	43	0	9		4	ov-20
3	aryana	523	380	43		36			339	1		1			ct-20
4	imachal Pradesh	001	001						95						ec-20
5	ammu and Kashmir	95	16	9	6	0			02	4					ec-20
6	harkhand	13	13						12						un-20
7	arnataka	245	090	55	0	5			044	6	2				ec-20
8	erala	166	146	0	0				114	2	3			7	ec-19
9	akshadweep														ep-20
0	adhya Pradesh	211	211						202						ec-20
1	aharashtra	6597	6597						6501	6	8	0		8	ct-20
2	anipur														eb-19
3	eghalaya	31	90	1	2	0			90						ug-19
4	izoram	6	3						3						ct-20
5	agaland	9	5						5						ec-19
6	disha	185	139	6	2	9			091	8	2				ov-20
7	uducherry	4	1						3						eb-20
8	unjab	807	736	1	1	4		6	623	13	8			1	ul-20
9	ajasthan	199	167	2	7				129	8	3				ct-20
0	ikkim	4	4						4						ug-20
1	amil Nadu	1491	1491						1456	5		4			ov-20
2	elangana	168	160						102	8	2	6			ec-20
3	ripura	9	5						5						ec-20
4	ttar Pradesh	017	978	9		4			903	5	6	9		0	ug-20
5	ttarakhand	43	43						43						ec-20

6	est Bengal	6	6						0						ov-20
TOTAL		**2314**	**0555**	**759**	**46**	**57**		**51**	**9515**	**040**	**66**	**06**	**2**	**56**	

Annexure -II

Compliance status of Grossly Polluting Industries (GPIs) located in Ganga main stem for 2017, 2018 and 2019

Year	2017				2018				2019			
Sector	**Total**	**Complying**	**Closed**	**Non Complying**	**Total**	**Complying**	**Closed**	**Non Complying**	**Total**	**Complying**	**Closed**	**Non Complying**
Distillery	**8**	15	12	21	**0**	42	8	0	**70**	61	8	1
Chemical & Others	**51**	50	26	75	**39**	118	20	1	**186**	157	24	5
Pulp & Paper	**0**	34	20	36	**5**	73	8	4	**93**	85	6	2
Sugar	**8**	34	8	46	**5**	77	8	0	**122**	111	7	4
Tannery	**90**	198	80	212	**09**	197	112	100	**58**	46	11	1
Textile	**42**	19	75	148	**93**	129	59	5	**197**	112	75	10
Total	**109**	**350**	**221**	**538**	**61**	**636**	215	**110**	**726**	**572**	131	**23**

*346 Tanneries of Kanpur are closed by UPPCB during KumbhMela out of 1072 GPIs in 2019.

MINUTES OF THE SIXTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2019-20) HELD ON MONDAY, 21 JANUARY 2020

The Committee sat from 1100 hours to 1310 hours in Committee Room 'B', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Dr. Sanjay Jaiswal – Chairperson

MEMBERS

LOK SABHA

2. Shri Bhagirath Chaudhary
3. Shri Nandkumar Singh Chauhan
4. Shri Nihal Chand Chauhan
5. Shri Chandra Prakash Choudhary
6. Shri Guman Singh Damor
7. Dr. K. Jayakumar
8. Shri Hasmukhbhai Somabhai Patel
9. Shri Dipsinh Shankarsinh Rathod
10. Ms. Agatha K. Sangma

RAJYA SABHA

11. Shri Harshvardhan Singh Dungarpur
12. Dr. Kirodi Lal Meena
13. Shri Madhusudan Mistry
14. Shri K. Bhabananda Singh

SECRETARIAT

1.	Dr. Preeti Srivastava	-	Joint Secretary
2.	Shri Raju Srivastava	-	Director

WITNESSES

I. Ministry of Jal Shakti - Department of Water Resources, River Development & Ganga Rejuvenation

1. Shri U.P Singh, Secretary (WR, RD & GR)
2. Smt. T. Rajeswari, Additional Secretary
3. Shri Jagmohan Gupta, JS&FA
4. Shri Surender Kumar Garg, Director (Parl.)

Central Water Commission (CWC)

Shri R. K. Sinha, Member (CWC)

Central Ground Water Board (CGWB)

1. Shri K. C. Naik, Chairman, CGWB
2. Dr. P. Nandakumaran, Member (CGWB)
3. Shri G. C. Pati, Member (CGWB)
4. Shri Sunil Kumar, Member (CGWB)
5. Shri Sanjay Marwaha, Regional Director (CGWB)
6. Dr. Uma Kapoor, Regional Director (CGWB)
7. Shri Ashish Kumar, Director (GW)

II. Ministry of Jal Shakti - Department of Drinking Water and Sanitation

Shri Samir Kumar, JS, DWS

III. Ministry of Rural Development

1. Shri Rohit Kumar, JS (MGNREGA)
2. Shri Umakant, JS (DoLR)

IV. Ministry of Environment, Forest and Climate Change (MoEF&CC)

Shri Jigmet Tapka, JS, MoEF&CC

V Ministry of Housing and Urban Affairs

1. Dr. M. Dhinadhayalan, Advisor (MoH&UA)
2. Shri Vinay Pratap Singh, Director (HUA)

VI Central Pollution Control Board

Dr. Prashant Gargava, Member Secretary (CPCB)

2. At the outset, the Hon'ble Chairperson welcomed the Members to the sitting of the Committee convened for oral evidence of the Ministry of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation) in connection with the examination of the subject "Ground Water – A Valuable but Diminishing Resource".

[The representatives of the Department of Water Resources, River Development & Ganga Rejuvenation were, then, ushered in]

3. After welcoming the representatives of the Department of Water Resources, River Development & Ganga Rejuvenation, the Chairperson drew their attention to Direction 55(1) of the Directions by the Speaker regarding confidentiality of the proceedings of the Committee and invited them to express their views on the subject. Thereafter, the representative of the Department highlighted the various aspects with reference to the groundwater through a Power Point Presentation.

4. Thereafter, the Members of the Committee deliberated on the following issues with regard to examination of the subject:-

(i) Status of Ground Water Resources in India.

(ii) Aquifer Mapping and construction of Artificial Recharge Structures for increasing the ground water level.

(iii) Paradigm shift in the ground water management with participation at Gram Panchayat level to formulate Water Security Plan.

(iv) Launching of Atal Bhujal Yojana by converging Schemes for supply side management of ground water.

(v) Difficulties faced by the Industries due to stay on the implementation of revised Guidelines by the National Green Tribunal notified by CGWA.

(vi) Low water use efficiency in the Agriculture Sector.

(vii) Ground Water contamination.

(viii) Use of MGNREGS funds for creation of structures instead of reviving Village Ponds.

(ix) Need to plan and act on the lines of Mission Indradhanush.

(x) Low penetration of actual 'Functional Tap' in the rural areas.

(xi) Issue of subsidies like free electricity to the Farming Sector.

(xii) Providing subsidy in the form of Direct Benefit Transfer (DBT).

(xiii) Inadequacy of manpower in the CGWB.

(xiv) Inadequate training provided by the Rajiv Gandhi National Ground Water Training and Research Institute.

(xv) Impact of excessive exploitation of Ground Water.

5. Concluding the discussion, the Chairperson thanked the representatives for giving a detailed perspective on the various aspects raised by the Members and expressing their views in a free and frank manner. The Chairperson further urged the Secretary, Department of Water Resources, River Development and Ganga Rejuvenation to furnish written replies to those queries raised by the Members which could not be replied by them, within a fortnight.

[The witnesses, then, withdrew]

6. A copy of the verbatim record of the proceedings of the sitting of the Committee has been kept.

The Committee, then, adjourned.

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MINUTES OF THE FOURTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES HELD ON MONDAY, 28 DECEMBER, 2020

The Committee sat from 1400 hours to 1615 hours in Committee Room 'D', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Dr. Sanjay Jaiswal – Chairperson

MEMBERS

LOK SABHA

2. Shri Vijay Baghel
3. Shri Bhagirath Chaudhary
4. Shri Guman Singh Damor
5. Shri Kaushal Kishore
6. Shri Hasmukhbhai Somabhai Patel
7. Shri Dipsinh Shankarsinh Rathod

RAJYA SABHA

8. Sardar Balwinder Singh Bhunder
9. Dr. Kirodi Lal Meena
10. Shri Arun Singh
11. Shri Subhash Chandra Singh
12. Shri Pradeep Tamta

SECRETARIAT

1.	Shri Manoj K. Arora	-	OSD (LSS)
2.	Shri M.K. Madhusudhan	-	Director
3.	Shri R. C. Sharma	-	Additional Director

WITNESSES

I. Ministry of Jal Shakti

A. Department of Water Resources, River Development & Ganga Rejuvenation

1. Shri U.P Singh, Secretary
2. Smt. Debashree Mukhrjee, Additional Secretary
3. Shri Subodh Yadav, Joint Secretary
4. Shri Ashish Kumar, Director (GW)

B. Department of Drinking Water & Sanitation

Shri Samir Kumar, Joint Secretary

C. Central Ground Water Board (CGWB)

1. Shri G. C. Pati, Chairman
2. Shri Sunil Kumar, Member Secretary
3. Shri S. Marhaha, Member

II. Ministry of Agriculture & Farmers' Welfare – Department of Agriculture, Cooperation & Farmers' Welfare

1. Dr. Alka Bhargava, Additional Secretary
2. Shri S. K. Malhotra, Commissioner (Agriculture)
3. Shri Atish Chandra, Joint Secretary (RFS)
4. Smt. Shubha Thakur, Joint Secretary (Crops)
5. Shri Pankaj Tyagi, Director (RFS)

III. Ministry of Rural Development – Department of Rural Development

Shri Rohit Kumar, Joint Secretary

IV. Ministry of Rural Development – Department of Land Resources

Shri Umakant, Joint Secretary

V. Ministry of Power

Shri Ghanshyam Prasad, Joint Secretary

2. At the outset, the Hon'ble Chairperson welcomed the Members to the Sitting of the Committee and apprised them that the Sitting has been convened to take oral evidence of the representatives of the Ministries of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation) and Agriculture & Farmers' Welfare (Department of Agriculture, Cooperation & Farmers' Welfare), on the subject "Groundwater: A Valuable but Diminishing Resource".

[The representatives of the Departments of Water Resources, River Development & Ganga Rejuvenation and Agriculture, Cooperation & Farmers' Welfare were, then, ushered in]

3. The Chairperson then welcomed the representatives of the Department of Water Resources, River Development & Ganga Rejuvenation and the Department of Agriculture, Cooperation & Farmers' Welfare, to the sitting and drew their attention to Direction 55(1) of the Directions by the Speaker regarding the confidentiality of the proceedings of the Committee. Thereafter, the representatives of the Department of Water Resources, River Development & Ganga Rejuvenation, made a power point presentation *inter alia*, highlighting the issues relating to ground water resource scenario, ground water contamination, implementation of National Aquifer Mapping and Management (NAQUIM) programme, Atal Bhujal Yojana, initiatives taken by the States for ground water conservation and steps required for sustainable management of ground water, etc. Thereafter, the representatives of the Department of Agriculture, Cooperation & Farmers' Welfare, made a brief presentation on the subject highlighting the various measures taken for sustainable ground water use and enhancing water use efficiency in agriculture viz. Crop diversification programme, Pradhan Mantri Krishi Sinchai Yojana (PMKSY)- Per Drop More Crop; Micro Irrigation and Soil health Card scheme etc. The important issues/ topics raised during the discussion on the subject, amongst others, included the following:

(i) Measures taken for increasing water use efficiency in agriculture and reduce ground water consumption by agriculture sector;

(ii) Disparity in allocation of funds to different States under Pradhan Mantri Krishi Sinchai Yojana (PMKSY)- Per Drop More Crop;

(iii) Incentives given to farmers for encouraging growing oilseeds and pulses crops;

(iv) Need for review of funding pattern under Pradhan Mantri Krishi Sinchai Yojana (PMKSY) Per Drop More Crop Scheme;

(v) Need for roping in more private players for supply of implements/equipments under micro irrigation scheme;

(vi) Regional disparities in implementation of Drip Irrigation Scheme

(vii) Use of Soil Health Cards for ground water quality monitoring;

(viii) Geo-tagging of assets created for water conservation under MGNREGA;

(ix) Issue of subsidized power to agriculture leading to over extraction of groundwater; and

(x) Use of solar pumps under Pradhan Mantri Kisan Urja Suraksha evam Utthaan Mahabhiyan (PM KUSUM) scheme.

4. The Chairperson then thanked the representatives of the Ministries of Jal Shakthi and Agriculture for making presentation on the various aspects of the subject and replying to the queries raised by the Members. He asked the representatives of both the Departments, to furnish written replies to those points/queries raised by the Members, which could not be readily replied to and/or on which detailed statistical replies are required, within a fortnight time .

[The witnesses, then, withdrew]

5. A copy of the verbatim record of the proceedings of the sitting of the Committee has been kept.

The Committee, then, adjourned.

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MINUTES OF THE FIFTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES HELD ON MONDAY, 18 JANUARY, 2021

The Committee sat from 1600 hours to 1800 hours in Committee Room 'D', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Dr. Sanjay Jaiswal – Chairperson

MEMBERS

LOK SABHA

2. Shri Bhagirath Chaudhary
3. Shri Nihal Chand Chauhan
4. Shri Guman Singh Damor
5. Shri Kaushal Kishore
6. Shri Kuruva Gorantla Madhav
7. Shri Hasmukhbhai Somabhai Patel

RAJYA SABHA

8. Sardar Balwinder Singh Bhunder
9. Dr. Kirodi Lal Meena
10. Shri A. Mohammedjan
11. Shri Arun Singh
12. Shri Subhash Chandra Singh
13. Shri Pradeep Tamta

SECRETARIAT

1. Shri Manoj K. Arora - OSD (LSS)
2. Shri M.K. Madhusudhan - Director
3. Shri R. C. Sharma - Additional Director

WITNESSES

I. Ministry of Environment, Forest and Climate Change (MoEF&CC)

1. Shri R. P. Gupta, Secretary (EF&CC)
2. Shri Ravi Shankar Prasad, Additional Secretary
3. Shri Richa Sharma, Joint Secretary
4. Shri Naresh Pal Gangwar, Joint Secretary
5. Dr. J. R. Bhatt, Advisor
6. Dr. Sundeep, Director, Control of Pollution (CP)

Central Pollution Control Board

1. Shri Shiv Das Meena, Chairman
2. Shri Prashant Gargava, Member Secretary

II. Ministry of Housing and Urban Affairs

1. Shri Durga Shanker Mishra, Secretary
2. Smt.D.Thara - Joint Secretary & Mission Director (AMRUT)
3. Shri V. P. Singh - Director (AMRUT-II)

III. Ministry of Jal Shakti

1. Shri G. Ashok Kumar, Managing Director, National Water Mission (NWM)
2. Shri Suneel Kumar Arora, Adviser (C&M)

Central Ground Water Board

1. Shri G.C. Pati, Chairman
2. Shri Sanjay Marwaha, Member
3. Dr. Uma Kapoor, Regional Director

2. At the outset, the Hon'ble Chairperson welcomed the Members to the Sitting of the Committee and apprised them that the Sitting has been convened to take oral evidence of the representatives of the Ministries of Environment, Forest and Climate Change and Housing and Urban Affairs in connection with the examination of the subject "Groundwater: A Valuable but Diminishing Resource". He further informed that a representative from the Ministry of Jal Shakti (Department of Water Resources, River Development and Ganga Rejuvenation) has also been invited to the Sitting for making submissions /clarifications on the subject.

[The representatives of the Ministries of Environment, Forest and Climate Change, Housing and Urban Affairs and the Department of Water Resources, River Development and Ganga Rejuvenation were then, ushered in]

3. The Chairperson then welcomed the representatives of the Ministry of Environment, Forest and Climate Change, Ministry of Housing and Urban Affairs and Ministry of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation) to the sitting and drew their attention to Direction 55(1) of the Directions by the Speaker regarding the confidentiality of the proceedings of the Committee.

4. Thereafter, the representatives of the Environment, Forest and Climate Change made a power point presentation *inter alia*, highlighting the issues relating to monitoring and assessment of ground water quality by Central Pollution Control Board (CPCB), Critically Polluted Areas, installation of online continuous effluent monitoring system, prevention and control of pollution in Grossly Polluting Industries, environmental compensation on illegal ground water extraction, impact of climate change on ground water resources, Action plan for ground water under National Water Mission, etc.

5. Thereafter, the representatives of the Ministry of Housing and Urban Affairs made a brief presentation on the subject highlighting the various measures taken for water management in urban areas such as reuse/recycling of water, reducing dependency on ground water for domestic water demand, recharging ground water through rainwater harvesting and preventing ground water contamination under Atal Mission for Rejuvenation and Urban Transformation (AMRUT), etc. The representative of Department of Water Resources, River Development & Ganga Rejuvenation also intervened in the discussion and explained about the goals and objectives of the National Water Mission. The important issues/ topics raised during the discussion on the subject, amongst others, included the following:

(i) Reduction in number of rainy days coupled with high intensity rainfall over the years along with widespread urbanization leading to less ground water recharge and heavy flooding in cities;

(ii) Launch of the scheme 'Catch the Rain Where it falls' for ground water recharge under National Water Mission;

(iii) Total number of factories set up on the banks of rivers and canals and online monitoring of the Effluent Treatment Plants (ETPs) installed, their actually functioning and the amount of water treated;

(iv) Need for physical verification of Sewage Treatment Plants (STPs) actually functioning;

(v) Need for coordination between Central and State Pollution Control Boards;

(vi) Storm water drainage systems created in Delhi and the amount of water recharged through such systems;

(vii) Need for formulating a National Guideline for increasing rainwater harvesting;

(viii) Need for giving financial assistance to those States which are recycling and reusing waste water for irrigation purposes;

(ix) Need for preventing line loss/pilferage in water distribution in Cities; and

(x) Need for empowering State Pollution Control Boards to impose penalty on the violating industries.

6. The Chairperson then thanked the representatives of the Ministries of Environment, Forest and Climate Change, Ministry of Housing and Urban Affairs and the Department of Water Resources, River Development and Ganga Rejuvenation, for making presentation on the various aspects of the subject and for replying to the queries raised by the Members. He asked the representatives of the Ministries to furnish written replies to those points/queries raised by the Members, which could not be readily replied to and/or on which detailed statistical replies are required, within a fortnight time .

[The witnesses, then, withdrew]

7. A copy of the verbatim record of the proceedings of the sitting of the Committee has been kept.

The Committee, then, adjourned.

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MINUTES OF THE SIXTH SITTING OF THE STANDING COMMITTEE ON WATER RESOURCES (2022-23) HELD ON TUESDAY, 14 MARCH 2023

The Committee sat from 1500 hours to 1530 hours in Committee Room 'D', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Parbatbhai Savabhai Patel - Chairperson

MEMBERS

LOK SABHA

2. Shri Vijay Baghel
3. Shri Nihal Chand Chauhan
4. Shri Bhagirath Choudhary
5. Shri Guman Singh Damor
6. Dr. K. Jayakumar
7. Shri Dhanush M. Kumar
8. Shri Sunil Kumar
9. Shri Hasmukhbhai Somabhai Patel
10. Smt. Agatha K. Sangma
11. Shri Pratap Chandra Sarangi
12. Shri Chandan Singh
13. Shri Shivkumar C. Udasi

RAJYA SABHA

14. Shri Aneel Prasad Hegde
15. Smt. Mausam Noor
16. Shri Arun Singh
17. Sant Balbir Singh
18. Shri Pramod Tiwari

SECRETARIAT

1.	Shri Chander Mohan	-	Joint Secretary
2.	Shri Ajay Kumar Sood	-	Director
3.	Shri R.L. Yadav	-	Additional Director

2. At the outset, the Chairperson welcomed the Members to the sitting of the Committee. Thereafter, the Committee took up for consideration (i) Draft Report on 'Demands for Grants (2023-24)' of the Ministry of Jal Shakti (Department of Water Resources, River Development & Ganga Rejuvenation); (ii) Draft Report on 'Demands for Grants (2023-24)' of the Ministry of Jal Shakti (Department of Drinking Water and Sanitation); and (iii) Draft Report on 'Groundwater: A Valuable but Diminishing Resource'. After due deliberation, the Committee adopted the aforesaid draft Reports, without any modification.

3. The Committee then authorized the Chairperson to present the Reports on their behalf to both the Houses of Parliament in the current Budget Session.

The Committee then adjourned

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